



DESIGN • QUALITY • EFFICIENCY • UTILITY

LIGHTING FIXTURES

HOLDENLINE

R E G I S T E R E D U . S . P A T E N T O F F I C E

HOLDENLINE

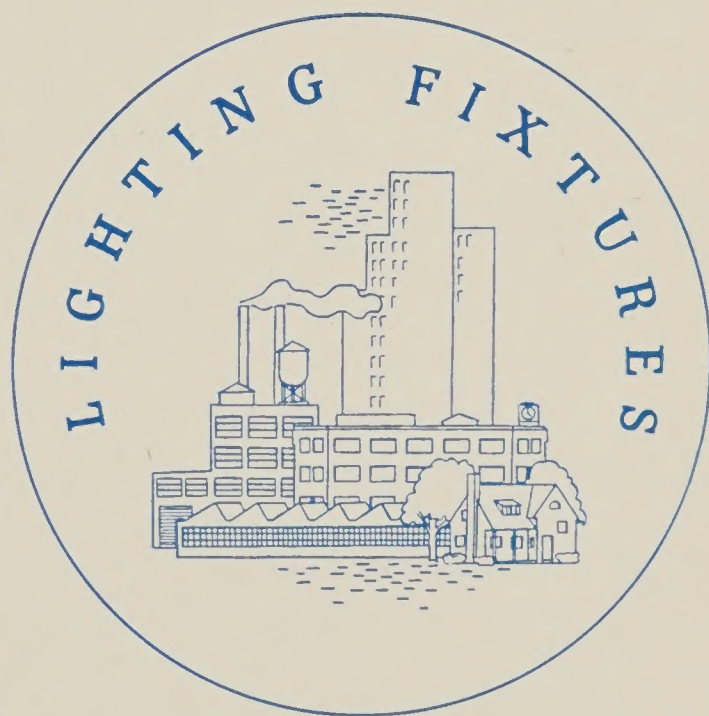
R E G I S T E R E D U . S . P A T E N T O F F I C E
1 9 3 7

JUN - 6 1939

FLUORESCENT FIXTURES OF ALL KINDS

LUMILINE BRACKETS

SPECIALTY FIXTURES



DEAN H. HOLDEN DESIGNER AND MANUFACTURER
MEMBER OF FLEUR-O-LIER STREAMLIGHTING MANUFACTURERS
2341 CARNEGIE AVE., CLEVELAND, OHIO - Cable Address: Nedloh

BRANCH OFFICES: Atlanta, Ga., Boston, Mass., Buffalo, N.Y., Chicago, Ill., Detroit, Mich., Dallas, Texas, Huntington, W. Va., Kansas City, Mo.,
Los Angeles, Cal., Minneapolis, Minn., New York, N. Y., Philadelphia, Pa., San Francisco, Cal., Spokane, Wash., St. Louis, Mo., Tampa, Fla.



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THE SWIFT TREND TO

FLUORESCENT LIGHTING



By DEAN H. HOLDEN

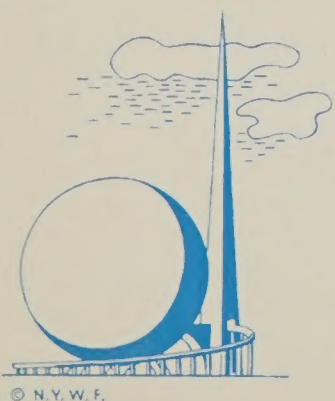
Designer and Manufacturer of

HOLDENLINE FLEUR-O-LIERS

Fluorescent lighting has captured the imagination of the public. The almost untold possibilities for **daylighting** have opened up a vast new market and have created a new opportunity for distributors of lighting fixtures.

Daylight Fluorescent has made new high efficiency illumination at lower cost available for factories, stores, drafting rooms and the graphic arts. It has

made color matching and color identification inexpensive. The field for Daylight Fluorescent in industrial and commercial lighting is already big — and ever widening.



Color Fluorescent brings a new economical source of decorative and display lighting.

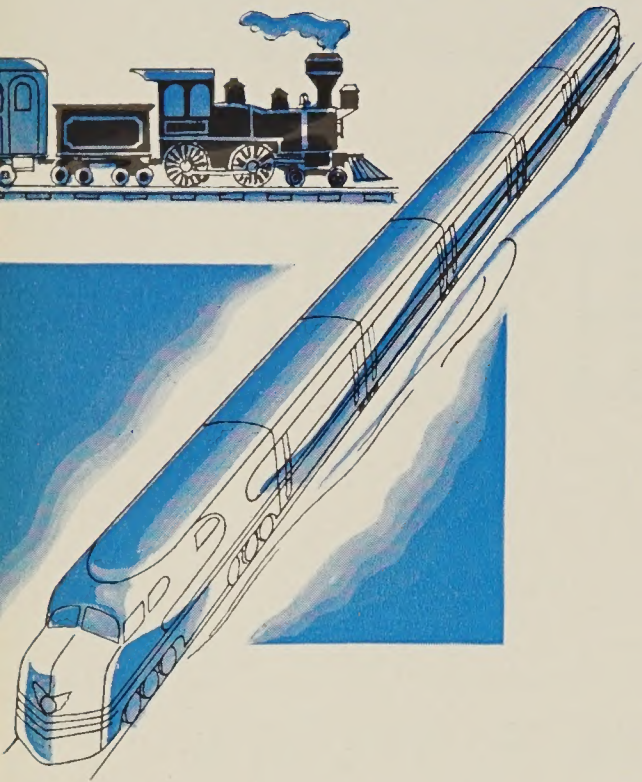
The New York World's Fair has chosen Fluorescent Lighting to light "The World of Tomorrow".

The San Francisco World's Fair has adopted it to express the spirit of modernity in lighting.

Smart night clubs, theaters, stores, shops and hotels everywhere have eagerly welcomed these new sources of colored light.

Already the trade has discovered in Fluorescent lighting a powerful incentive to interest buyers and we are not exaggerating in the slightest when we assert our belief that it is now the golden field of lighting opportunity.

Which is the shortest route to this new market?



Looking at Fluorescent lighting through the average consumer's eyes, it seemed to me that he would more quickly adopt this new kind of lighting if he could receive its benefits in his factory, store or office as easily, inexpensively, and conveniently as he

puts a floor lamp in his home.

This led to the development of the **HOLDENLINE** Fleur-O-liers . . . complete packages for all phases of Fluorescent Lighting.

As an architect, with a lighting consultant background, my work in supervising such lighting installations as Severance Hall, in Cleveland, and the Indiana World War Memorial, led me to the conclusion that fixtures which met the following require-

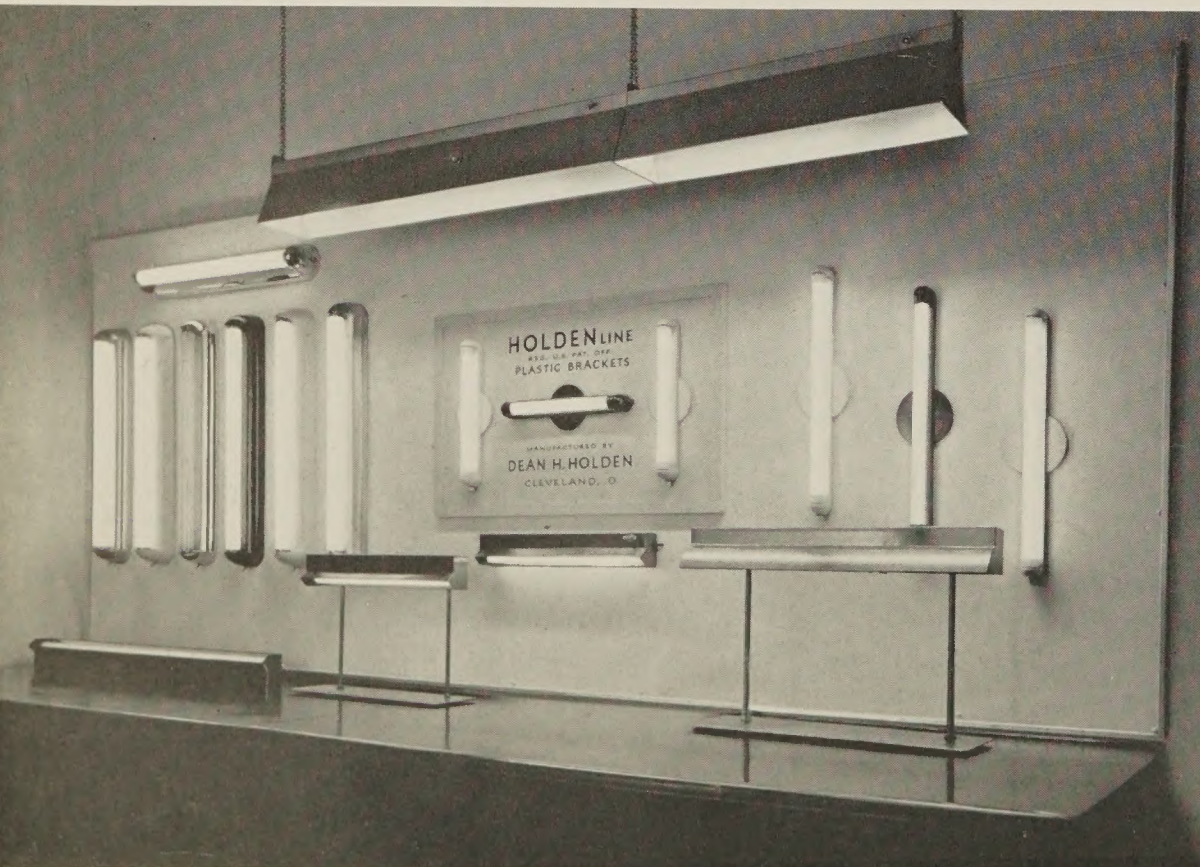
ments would gain the quickest acceptance and widespread sale:

- (a) Deliver the kind and quantity of light required for specified tasks.
- (b) Be easy to install.
- (c) Have the flowing, clean lines of modern design, in keeping with the trend of functionalism in architecture, automobiles, railroads and modern products.

Through my friendly, professional association with the engineers of the General Electric Company, at Nela Park, and the engineers of the Westinghouse Lamp Company, I have been in intimate touch with all phases of Fluorescent lighting since the development of the revolutionary new **FLUORESCENT MAZDA** lamps.

General Electric, Westinghouse and Hygrade engineers have given me full cooperation to help me achieve my objective, which is to have each **HOLDENLINE** fixture embody the highest standards of lighting in a convenient package.

Section of Display Room showing some of the new **HOLDENLINE** fixtures



CERTIFICATION BY ELECTRICAL TESTING LABORATORIES

When the above certificate is attached to a **HOLDENLINE** Fleur-O-lier, it certifies compliance to all the specifications set up by the Fleur-O-lier Manufacturers, the General Electric Company and the Westinghouse Electric and Manufacturing Company, to insure satisfactory performance to the user of Fluorescent Mazda lamps.

We quote from the seal of certification:

"The MAZDA lamp manufacturers guarantee the performance of Fluorescent MAZDA lamps only when used with auxiliary equipment bearing this label."

Can you ask for stronger assurance of satisfactory performance?



A Word about the New Tubes of Light

Let us look at these new Fluorescent MAZDA lamps which are making such a furore in lighting circles.

Why have they excited more interest among lighting users than any other lighting development since the invention of the tungsten filament lamp?

The answer to this question lies in the amazing new lighting efficiencies and economies introduced by these revolutionary new light sources.

They have made new indoor daylight available for stores, offices, drafting rooms and factories, and colorful, dramatic new lighting effects available for specialty shops, theaters, and night clubs.

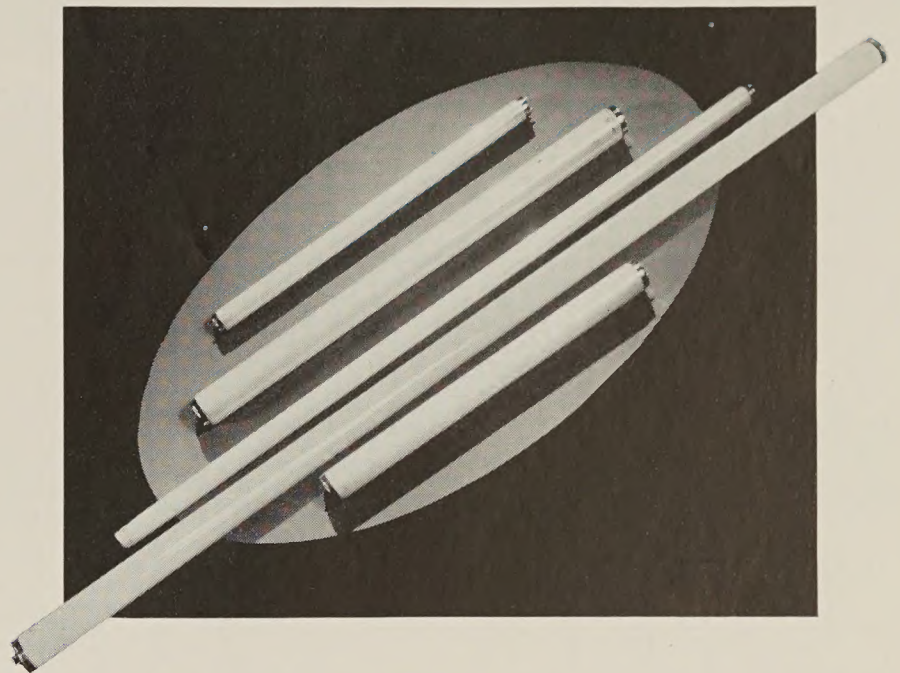
These new slender tubes of glass generate daylight, and colored light, from three times to two hundred times as efficiently as comparable incandescent light sources.

They are 50% cooler than ordinary MAZDA lamps. Less than half the radiant heat, as well as more light per watt, is obtained from fluorescent lamps than is obtained from ordinary lamps. This makes high lighting efficiencies available without discomfort and permits air conditioning systems to function at their highest efficiency.

How do fluorescent lamps differ from ordinary lamps? These new lamps are of the electric discharge type, employing mercury vapor with a trace of argon, as the medium for sustaining the arc.

Light is produced through the agency of invisible radiation acting on fluorescent powders with which the lamp is coated internally. Various powders transform this ultra-violet radiation at different wave lengths, with the result that colored light in interesting and useful shades, is produced efficiently and directly, rather than by absorption filters.

Fluorescent MAZDA lamps are now available in the following sizes:



Sizes:	15-watt	18-inch	T- 8	(1 " diameter)
	15-watt	18-inch	T-12	(1½" diameter)
	20-watt	24-inch	T-12	(1½" diameter)
	30-watt	36-inch	T- 8	(1 " diameter)
	40-watt	48-inch	T-12	(1½" diameter)

The average useful life of these lamps is 2,000 hours or better.

Fluorescent MAZDA lamps are gaseous discharge type lamps, and as such need a ballast. Some type of auxiliary, which includes a choke coil, an automatic starting switch or a resonant circuit is required. In most cases each individual lamp requires a separate auxiliary.

Fluorescent MAZDA lamps are designed primarily for AC Operation. Special auxiliaries are available for operation on 50-cycle current.

The use of Fluorescent MAZDA lamps is not confined to AC current only. They may be operated on DC current with special control equipment which is contained in the units we offer when so ordered.

Our units are designed for "over the counter" sales, complete packages of Fluorescent Lighting, ready to plug in and use when they are received.



THE MARKET FOR HOLDENLINE FLEUR-O-LIERS

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Our units are designed for local lighting, where high intensity artificial daylight, or color lighting, is required. We also have certain items which are recommended for decorative lighting, but not, in most cases, for general illumination.

They have had quick acceptance and ready sale in the following fields:

FACTORIES:

Thanks to the Daylight Fluorescent Lamp, color matching and color discrimination can now be done inexpensively. High level illumination for fine production, assembly and close inspection, may be produced without discomfort.

The HOLDENLINE UTILITY Fleur-O-lier makes these benefits available either as single unit for a

bench, or as a multiple fixture for a large working area.

RETAIL STORES:

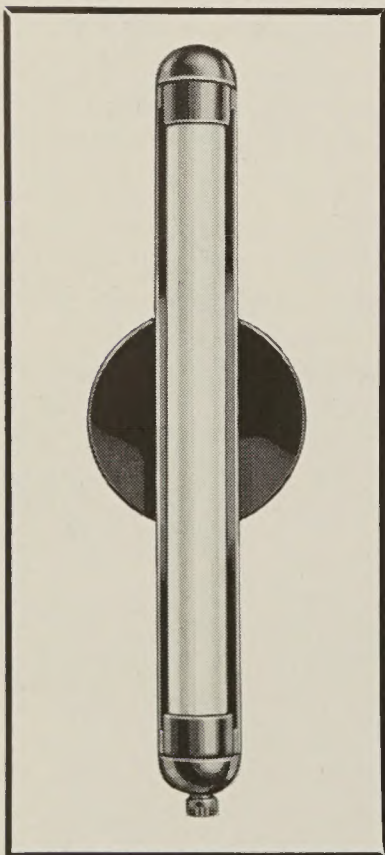
Fluorescent lighting puts a new punch into retail selling. HOLDENLINE MERCHANDISING Fleur-O-liers make this new sales power available both to the small store and the large department store for specialized purposes, such as color matching and discrimination, better sales-making light in fitting rooms, and for adding new attractiveness to displays of merchandise on showcases.

OFFICES and DRAFTING ROOMS:

HOLDENLINE Fluorescent Fixtures also bring local daylight illumination to offices and drafting tables without undue brightness or heat and make close-seeing easier.

SMART NEW HOLDENLINE PLASTIC BRACKETS

REGISTERED U. S. PATENT OFFICE
1 9 3 7



LUMILINE BRACKET

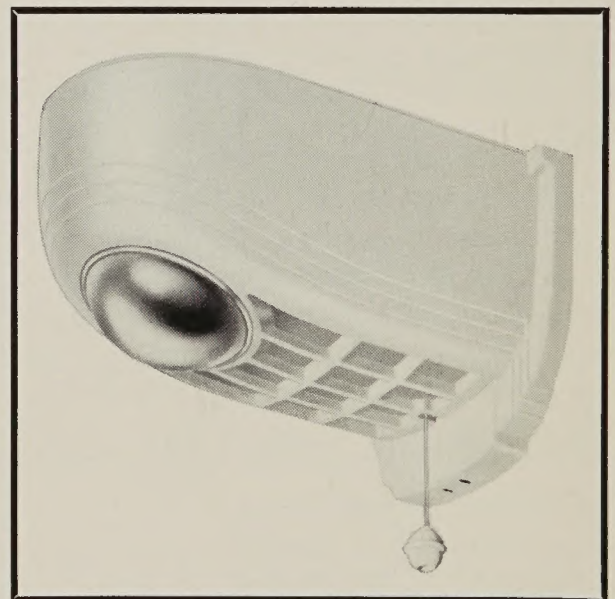
Two of the newest HOLDENLINE products are the Plastic Lens Bracket and the Plastic Lumiline Fixture.

The Lens Bracket, a cleanly designed, white plastic wall bracket, provides for the first time, a really scientific lighting unit over the bathroom mirror, for boudoir table, and for many other purposes.

The Lumiline Fixture, while originally designed for use beside the bathroom mirror, has found wide acceptance in night clubs, lobbies, hotels and similar locations.

The combination of Lens Bracket and Lumiline fixture provides perfect light for shaving and applying make-up. Note: These are not Fluorescent.

Our plastic fixtures have a high ratio of strength to weight, will not rust, tarnish, or peel, and offer complete safety from shock.



LENS BRACKET

The HOLDENLINE Fleur-O-liers, plus our Lumiline Brackets and Lens Brackets, give you a compact line for gaining new fixture business in commercial, industrial and residential lighting.

2341 CARNEGIE AVE. DEAN H. HOLDEN CLEVELAND, OHIO

Indoor Daylight IN A CONVENIENT PACKAGE

HOLDENLINE

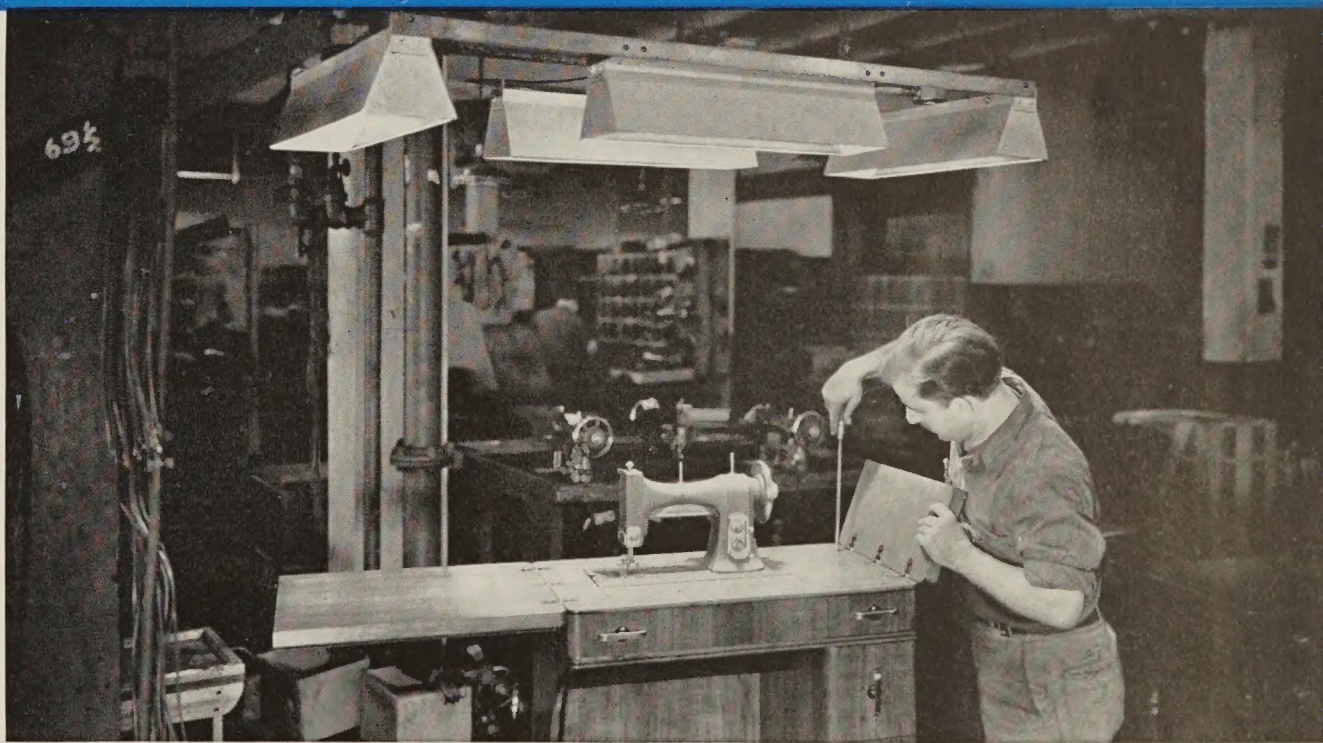
REGISTERED U. S. PATENT OFFICE
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Utility Fluorolier

For FLUORESCENT Lighting in Factories, Offices, Stores. For Color Matching and Identification — For Efficient Production, Assembly and Inspection

In our own shop, we felt the need of a highly efficient, compact unit for bench use. We wanted a unit that packed a real lighting punch — one that would throw plenty of light down on the work without spillover or waste — one that would shield the light source and thus reduce eyestrain.

We developed several models, gradually increasing the efficiency and reducing the size to a point where a further reduction in size would have impaired the efficiency. That we didn't go wrong is proved by the figures of a reputable



testing laboratory, showing total overall efficiency of 80.1%, an amazingly high figure.

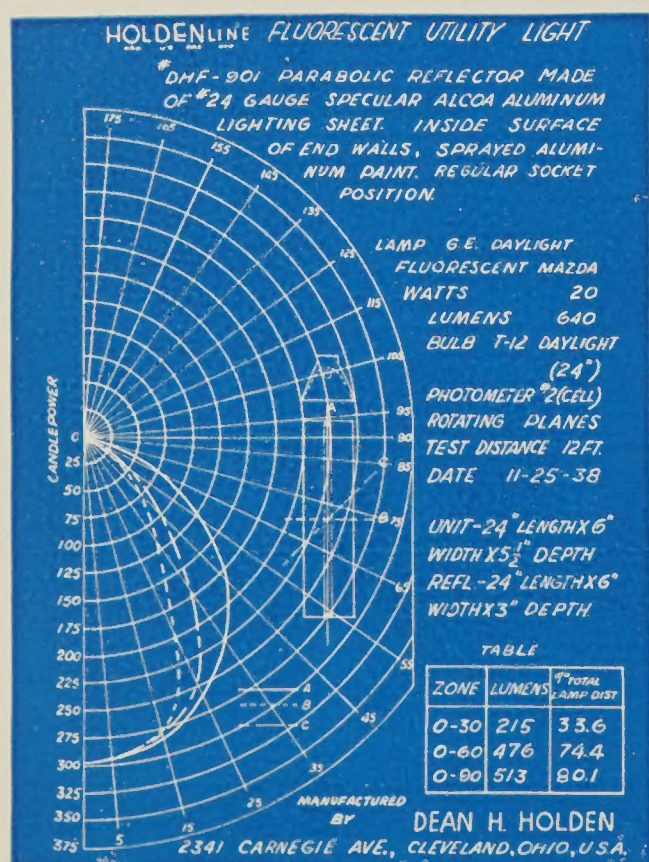
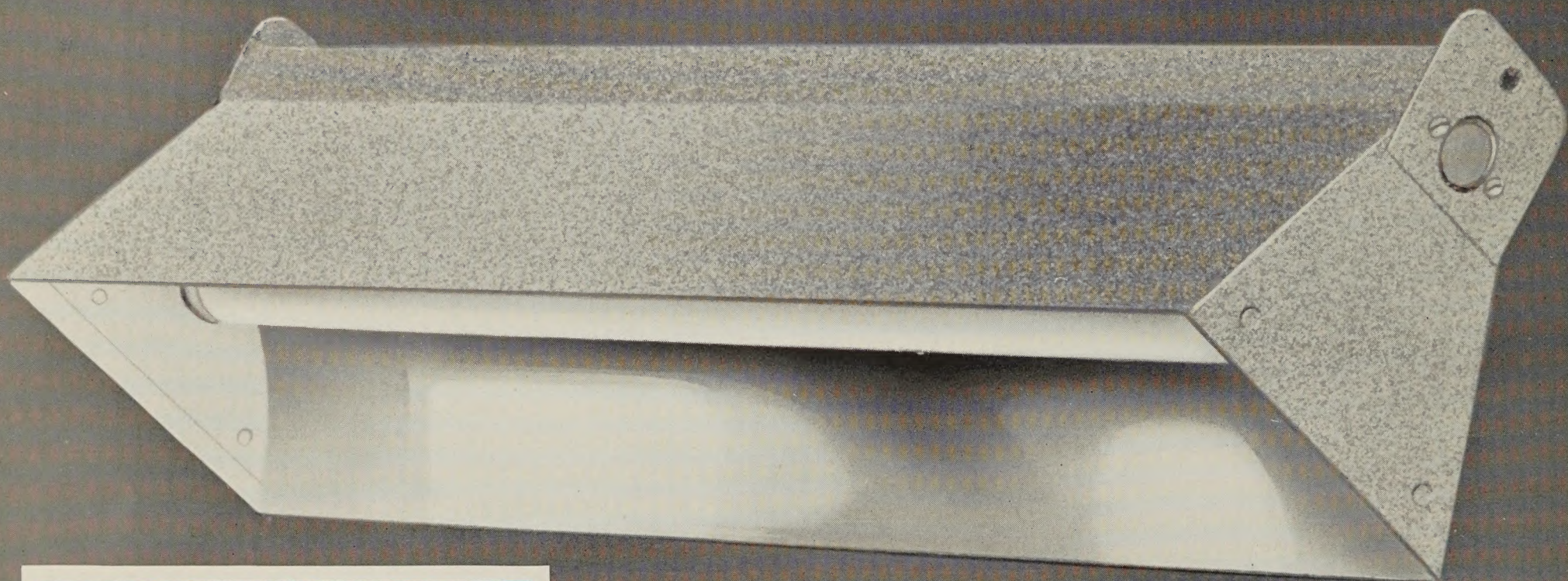
The result is a highly practical, rugged unit with a wide variety of uses in industrial and commercial lighting.

HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Utility Fleur-O-lie

DHF 900 SERIES



This new **HOLDENLINE FLUORESCENT** is a welded assembly, made of heavy gauge steel in durable wrinkled aluminum finish . . . engineered in every detail for maximum service and lighting efficiency.

Our reflectors are made of Alzak* Aluminum, in specular finish, and this highly efficient reflecting surface, plus proper contour and depth, concentrates the light on bench, counter or machine and does not waste it by spilling it all over the floor as a matte reflector invariably does.

Our one-lamp unit, in general, will give approximately double the footcandles on the working area, in comparison with a similar unit using white or matte reflector.

Unit is complete with approved auxiliary and sockets unless specified as chassis only. AVAILABLE FOR 18, 24, 36 and 48" lamps. 6 1/8 inches wide. 5 1/2 inches high.

* "Registered Trade-mark Aluminum Company of America"

WHERE THIS UNIT CAN BE USED

The **HOLDENLINE** Utility Fleur-O-lier can be used to speed production and sales wherever high intensity Daylighting is required.

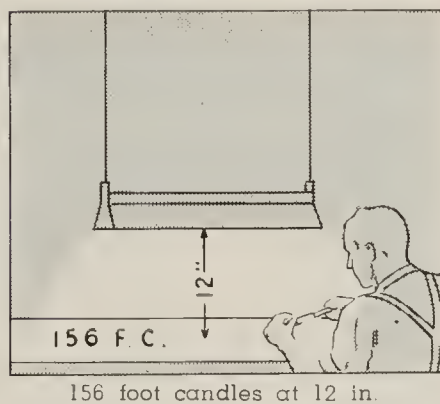
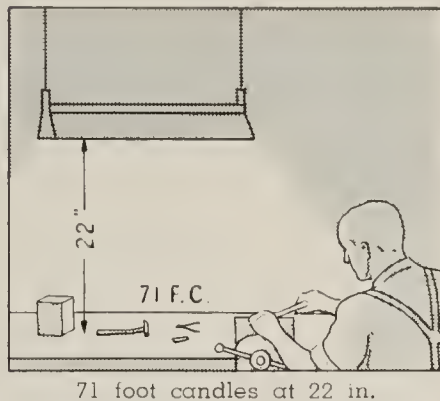
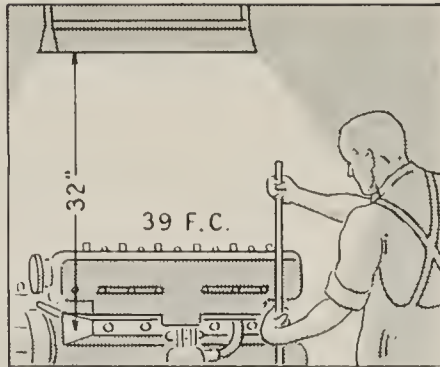
In factories, it gives the world's finest working light for fine assembly, close inspection and intricate operations. It insures accuracy where form and color must be checked closely. The efficient design of its **ALZAK *ALUMINUM** reflector evens surface brightness and makes it an exceptionally good unit for the inspection of polished surfaces for blow holes, deep scratches, dings and pits.

In stores, this new Fluorescent unit helps speed sales by making color matching and color identification inexpensive.

In offices, it provides real indoor daylight eye ease for draftsmen and other office workers whose task requires close, concentrated seeing.

Our Utility Unit has been purposely made somewhat deeper than comparable items, so that when mounted over work table at a convenient height, the light source is not visible to the worker, as the accompanying sketches show.

It may be used as a single unit or "ganged" together to light a large working area where high intensity illumination is required. (See methods of mounting).



These pictures show the amazingly high light output of a 20-watt daylight Fluorescent lamp in a **HOLDENLINE** 901 B Utility Unit at various heights. Note that at all times the light source is out of line of the worker's vision.

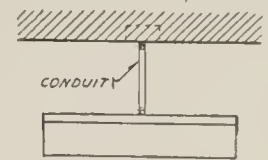
Other Uses — FLUORESCENT Utility Unit (Using Daylight Lamp)

- | | | |
|--------------------------------|---|---|
| 1. Color matching of all kinds | 6. Tanneries and Leather Shops | 15. Decorating chinaware |
| 2. Publishing and printing: | 7. Shoe factories | 16. Furriers factories |
| (a) Press and composing rooms | 8. Paint Manufacturing | 17. Grading of oak flooring |
| (b) Printing and engraving | 9. Ink Manufacturing | 18. Chemical Laboratories |
| (c) Color work and rendering | 10. Paper Manufacturing | 19. Medicine |
| (d) Proof reading | (a) Wall paper | 20. Laundries |
| 3. Automobile Manufacturing: | 1. Display rooms | 21. Drafting Rooms |
| (a) Assembly lines | (b) Fancy papers, etc. | 22. Small art and specialty shops |
| (b) Painting department | 11. Tobacco grading, cigar factories | 23. Stores |
| 4. Textile Mills: | 12. Inspection of porcelain enameled surfaces | 24. In public school manual training shops |
| (cotton, silk, woolen, etc.) | 13. Lighting in art schools | 25. Over workbenches, sinks and sewing tables in the home |
| 5. Dry Cleaning | 14. Food canneries | 26. Background lighting in store windows and displays |
| | (a) Fruit grading | |
| | (b) Inspecting | |
| | (c) Meat packing | |

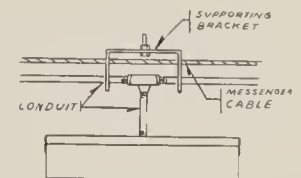
* "Registered Trade-mark Aluminum Company of America"

Methods OF MOUNTING

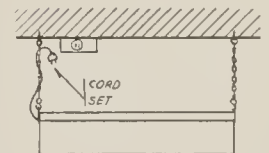
The **HOLDENLINE** Utility Fleur-O-lier may be hung suspended from the ceiling by wire, chain, conduit, etc. We recommend the following methods of mounting:



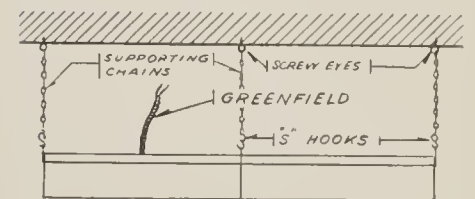
Mounted to flush type outlet box using conduit.



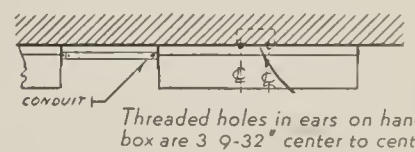
Mounted to conduit suspended by messenger cable.



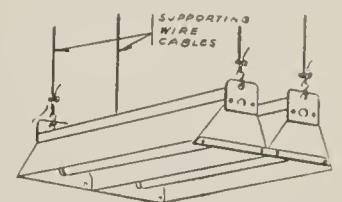
Mounted near surface conduit or outlet. Chain suspension.



Reflectors are so constructed to facilitate flush end to end mounting to form a continuous strip of lighting.



Conduit used between units to space end-to-end mounting. Flush ceiling mounting.



It may be desirable to mount reflectors in parallel. Connecting bars will be furnished on special quotation.

Mounting Arms ADD VERSATILITY TO HOLDENLINE UTILITY FLEUR-O-LIERS

REGISTERED U. S. PATENT OFFICE
1 9 3 7

We knew that there were spots in thousands of offices and factories, where close work was performed, that needed the high efficiency daylighting provided by our utility unit, but in which suspended fixtures would not serve. The mounting arms shown below still further extend the ability of our Utility Unit, to give high efficiency light wherever needed.

Table Clamp Arm which may be fastened to tables, drafting boards, benches, desks, etc., to provide working light of daylight quality. Height 29", mounting unit 19" to bottom from plane of table. Made of $\frac{3}{8}$ " pipe. Shipping weight, 5 lbs.



Portable Floor Model, with an extension feature, which may be easily adjusted to various heights to give good light where needed. Lowest adjustment to under side of reflector 56", highest 74". Made of $\frac{3}{4}$ " pipe. Shipping weight, 45 lbs.



Provides eye-saving light for the drafting table

Trolley Track Attachment. Not a portable but a permanent installation, for shifting light to a particular operator . . . if long bench has few occupants. U-shaped bracket fits into Bulldog Trolley which has buss bars, so that trolley picks up current as it goes along. Bulldog Trolley not included.



Arms furnished in a black wrinkle finish contrasting attractively with our aluminum unit. Arms must be ordered with units, as they are furnished wired with cord and plug, and a special cord connector is provided for attaching to the special connector on our 900 series unit. Arms not sold separately. Note: Above catalog numbers do not include 900 series units. **Table clamp and floor stand suitable for 900, 901 and 1900 units only.**

DEAN H. HOLDEN

2341 CARNEGIE AVENUE
CLEVELAND, OHIO

SPECIFICATIONS

HOLDEN_{LINE} FLEUR-O-LIER

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Single Lamp Utility Unit

DHF-900 SERIES

- . . . Extremely rugged welded assembly.
- . . . Made of heavy gauge steel.
- . . . Durable wrinkled aluminum finish.
- . . . Dimensions: 6½" wide, 5½" high.
4 lengths to take all sizes of Fluorescent Lamps - 18", 24", 36" and 48" lamps.
- . . . 3 knockouts for ½" conduit, center of top and in both ends.
- . . . Alzak* specular aluminum reflector sheet which snaps out easily, snaps back into place, and can't possibly fall out.
- . . . Units operate on various A.C. 60 Cycle voltages. Also available for 50 Cycle operation on special order. Can also be furnished for operation on Direct Current. See reverse side for complete details
Specify current and frequency on all orders.
- . . . Complete with approved auxiliary and sockets, unless specified as chassis only.
- . . . When ordered unwired, wire is furnished.
- . . . Pigtails or complete 7 ft. cord set furnished when ordered wired.
- . . . Durable toggle type switch can be supplied. Installed near end on side of unit.
- . . . When furnished wired with cord set, 7 ft. of SV 2 conductor cord and molded rubber plug, coming out of bushing in center top knockout, are provided unless otherwise specified. Can also be furnished with 7 ft. type SJ 3 conductor cord 3 prong plug to meet underwriters requirements.
- . . . In the 36" size we particularly recommend the BL type auxiliary because of its 80% leading power factor.
- . . . Approximate shipping weights:

DHF 900 — 18" unit 8 lbs.

DHF 901 — 24" unit 10 lbs.

DHF 902 — 36" unit 15 lbs.

DHF 903 — 48" unit 21 lbs.

Standard Package One Unit

* "Registered Trade-mark Aluminum Company of America"

SEE OTHER SIDE BEFORE ORDERING

2341 Carnegie Ave. **Dean H. Holden** Cleveland, Ohio

TABULATION OF 900 SERIES UNITS

EACH UNIT DESIGNED FOR ONE LAMP ONLY

Catalogue Numbers	Length	Width	Depth	Watts	Chassis Only	Chassis Thermal Aux. Sockets	Chassis Magnetic Aux. Sockets	Voltage A. C. ● 60 Cycle	Voltage D. C.	Power Factor	List	Jobber Net
DHF - 900 A	18 1/4"	6 1/8"	5 1/2"		✓							
DHF - 900 B	18 1/4"	6 1/8"	5 1/2"	15		✓		115		50		
DHF - 900 BM	18 1/4"	6 1/8"	5 1/2"	15			✓	115		50		
DHF - 900 DC	18 1/4"	6 1/8"	5 1/2"	15		✓			115			
DHF - 901 A	24 1/4"	6 1/8"	5 1/2"		✓							
DHF - 901 B	24 1/4"	6 1/8"	5 1/2"	20		✓		115		50		
DHF - 901 BM	24 1/4"	6 1/8"	5 1/2"	20			✓	115		50		
DHF - 901 DC	24 1/4"	6 1/8"	5 1/2"	20		✓			115			
DHF - 902 A	36 1/4"	6 1/8"	5 1/2"		✓							
DHF - 902 B	36 1/4"	6 1/8"	5 1/2"	30		✓		230		50		
DHF - 902 C	36 1/4"	6 1/8"	5 1/2"	30		✓		115		50		
DHF - 902 BM	36 1/4"	6 1/8"	5 1/2"	30			✓	230		50		
DHF - 902 BL	36 1/4"	6 1/8"	5 1/2"	30		✓		115	80% Leading			
DHF - 902 DC	36 1/4"	6 1/8"	5 1/2"	30		✓			230			
DHF - 903 A	48 1/4"	6 1/8"	5 1/2"		✓							
DHF - 903 B †	48 1/4"	6 1/8"	5 1/2"	40		✓		230		50		
DHF - 903 BM †	48 1/4"	6 1/8"	5 1/2"	40			✓	230		50		
DHF - 903 DC	48 1/4"	6 1/8"	5 1/2"	40		✓			230			

SEE PRICE LIST

● Available for 50 Cycle operation. Prices on application.

For switch on all units add:

For wiring with pig tails add:

For wiring with SV two-conductor 7' long rubber cord
and plug add:

For wiring with SJ three-conductor rubber cord 7' long
and three-prong plug add:

† Step-up transformer for external mounting can be
supplied for 115 volt operation.

LIST

NET

SEE PRICE LIST

CHECK THESE QUESTIONS
WHEN WRITING ORDER

1. Have you specified complete catalog number?

2. Have you specified type of wiring, or unwired?

3. Have you specified whether with or without switch?
4. Have you specified whether units ordered are for use on our mounting arms?

5. Have you specified voltage and frequency?

6. Have you specified whether for A. C. or D. C. operation?

NOTE: Lamps not included.

HOLDENLINE

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9 3 7

Twin Utility Light

DHF 1900 SERIES



Specially designed for use with the dual auxiliary which operates two lamps at a unity power factor and about 106° out of phase, thus reducing stroboscopic effect to a minimum, this new unit is Dean Holden's unequivocal answer to industry's demand for even higher levels of indoor daylight.

This twin utility unit can be mounted higher above the work, thus giving a greater spread of light while still maintaining positively high lighting values on the working area.

Wherever fine inspection, processing and assembly are indicated, this DHF 1900 series should be specified. It will produce the quantity and quality of Fluorescent Daylight that lessens the waste caused by errors and spoilage and boost quantity, quality

and uniformity of output. It helps the human eye to detect imperfections of any sort by its revealing light, because the Twin Utility Light makes it easier to see than not to see! Moreover, when eyes are not fatigued, minds and bodies are more alert.

The Alzak* aluminum reflectors are specifically designed to keep the light out of the workers' eyes. They work under abundant, glareless, indoor daylight with minimum eyestrain and fatigue.

For end-to-end mounting, bolts are provided when ordered. For side-by-side mounting, connecting bars can be furnished on special quotation.

NOTE: At present the dual auxiliary referred to above is available only for 18" and 24" sizes, but development of other sizes is under way. Nobody knows when they will be ready. Meantime, equipment, in all sizes with thermal or magnetic auxiliaries can be furnished at a substantial saving in list price.

* "Registered Trade-mark Aluminum Company of America"

Indoor Daylight IN A CONVENIENT PACKAGE

DESCRIPTION

The "1900" Twin Utility Light is a rugged, welded assembly, made of heavy gauge steel with a durable, wrinkled aluminum finish. It is a little shallower than our "900" series, as the auxiliaries are mounted between reflectors in the wiring raceway. Auxiliary and wiring channels are easily accessible by snapping out reflectors and removing two screws.

Switch is mounted on top.

Knockouts are in each end and in center of top for $\frac{1}{2}$ " conduits.

Specially designed for use with auxiliary which operates two lamps at unity power factor and 106° out of phase, thus reducing stroboscopic effect. Can also be furnished with two standard auxiliaries at a somewhat lower price. Dual auxiliaries are at present only available in 15 and 20 watt sizes.

Can be mounted higher above the working surface giving a greater spread of light.

48-inch size can be supplied only for operation on 230-volt current but a small step-up transformer for external mounting can be furnished for 115 volt operation.

Also available for DC operation on 230 volts only.



Showing the DHF 1900 series Twin Utility Light in use in composing room of printing plant. For all fine work and for color matching, Fluorescent Daylight with its coolness and freedom from harmful glare, is bringing new accuracy and eye comfort to industry.

Capacitors for power factor correction can be supplied for 36" and 48" units. Type BS auxiliary gives unity power factor for the 18" and 24" sizes. Write for engineering data and prices.

Specify current and frequency on all orders.

Complete with approved auxiliary and sockets, unless specified as chassis only. When ordered unwired, wire is furnished.

DEAN H. HOLDEN

2341 CARNEGIE AVENUE
CLEVELAND, OHIO

SPECIFICATIONS

HOLDEN_{LINE} FLUORESCENT

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Two Lamp Utility Unit

DHF-1900 SERIES

- . . . Extremely rugged welded assembly.
- . . . Made of heavy gauge steel.
- . . . Durable wrinkled aluminum finish.
- . . . Dimensions: 12 $\frac{1}{4}$ " wide, 4 $\frac{5}{16}$ " high.
4 lengths to take all sizes of Fluorescent Lamps - 18", 24", 36" and 48" lamps.
- . . . 3 knockouts for $\frac{1}{2}$ " conduit, center of top and in both ends.
- . . . Alzak* specular aluminum reflector sheet which snaps out easily, snaps back into place, and can't possibly fall out.
- . . . Units operate on various A.C. 60 Cycle voltages. Also available for 50 Cycle operation on special order. Can also be furnished for operation on Direct Current. See reverse side for complete details.
Specify current and frequency on all orders.
- . . . Complete with approved auxiliaries and sockets, etc., unless specified as chassis only.
- . . . When ordered unwired, wire is furnished.
- . . . Pigtales or complete 7 ft. cord set furnished when ordered wired.
- . . . Durable toggle type switch can be supplied. Installed near end on top of unit.
- . . . When furnished wired with cord set, 7 ft. of SV 2 conductor cord and molded rubber plug, coming out of bushing in switch end of unit are provided unless otherwise specified. Can also be furnished with 7 ft. type SJ 3 conductor cord 3 prong plug to meet underwriters requirements.
- . . . We particularly recommend the BS type of auxiliary in the 18" and 24" sizes due to lessened stroboscopic effect and unity power factor. The type BL auxiliary for the 36" size is recommended because of its 80% leading power factor.
- . . . Approximate shipping weight:
 - 1900 — 18" unit 15 lbs.
 - 1901 — 24" unit 19 lbs.
 - 1902 — 36" unit 22 lbs.
 - 1903 — 48" unit 36 lbs.

Standard Package One Unit

* "Registered Trade-mark Aluminum Company of America"

SEE OTHER SIDE BEFORE ORDERING

2341 Carnegie Ave. **Dean H. Holden** Cleveland, Ohio

TABULATION OF 1900 SERIES UNITS

EACH UNIT DESIGNED FOR USE OF TWO LAMPS

Catalogue Numbers	Length	Width	Depth	Watts	Chassis Only	Chassis Thermal Aux. Sockets	Chassis Magnetic Aux. Sockets	Voltage A. C. 60 Cycle	Voltage D. C.	Power Factor	List	Jobber Net
DHF - 1900 A	18 1/4"	12 1/4"	4 5/16"		✓							
DHF - 1900 B	18 1/4"	12 1/4"	4 5/16"	30		✓		115		50		
DHF - 1900 BS*	18 1/4"	12 1/4"	4 5/16"	30		✓		115		Unity		
DHF - 1900 DC	18 1/4"	12 1/4"	4 5/16"	30		✓			115			
DHF - 1901 A	24 1/4"	12 1/4"	4 5/16"		✓							
DHF - 1901 B	24 1/4"	12 1/4"	4 5/16"	40		✓		115		50		
DHF - 1901 BS*	24 1/4"	12 1/4"	4 5/16"	40		✓		115		Unity		
DHF - 1901 BM	24 1/4"	12 1/4"	4 5/16"	40			✓	115		50		
DHF - 1901 DC	24 1/4"	12 1/4"	4 5/16"	40		✓			115			
DHF - 1902 A	36 1/4"	12 1/4"	4 5/16"		✓							
DHF - 1902 B	36 1/4"	12 1/4"	4 5/16"	60		✓		230		50		
DHF - 1902 C	36 1/4"	12 1/4"	4 5/16"	60		✓		115		50		
DHF - 1902 BM	36 1/4"	12 1/4"	4 5/16"	60			✓	230		50		
DHF - 1902 BL	36 1/4"	12 1/4"	4 5/16"	60		✓		115		80% Leading		
DHF - 1902 DC	36 1/4"	12 1/4"	4 5/16"	60		✓			230			
DHF - 1903 A	48 1/4"	12 1/4"	4 5/16"		✓							
DHF - 1903 B †	48 1/4"	12 1/4"	4 5/16"	80		✓		230		50		
DHF - 1903 BM †	48 1/4"	12 1/4"	4 5/16"	80			✓	230		50		
DHF - 1903 DC	48 1/4"	12 1/4"	4 5/16"	80		✓			230			

SEE PRICE LIST

● Available for 50 Cycle operation. Prices on application.

* Tulamp auxiliary (one auxiliary operates two lamps).

For switch on all units add:

For wiring with pig tails add:

For wiring with SV two-conductor 7' long rubber cord and plug add:

For wiring with SJ three-conductor rubber cord 7' long and three-prong plug add:

† Step-up transformer for external mounting can be supplied for 115 volt operation.

LIST

NET

SEE PRICE LIST

CHECK THESE QUESTIONS WHEN WRITING ORDER

- Have you specified complete catalog number?
- Have you specified type of wiring, or unwired?
- Have you specified whether with or without switch?
- Have you specified whether units ordered are for use on our mounting arms?
- Have you specified voltage and frequency?
- Have you specified whether for A. C. or D. C. operation?

NOTE: Lamps not included.

THE LAMP THE *Business World*
HAS BEEN WAITING FOR . . .

HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Desk Lamp

DSK SERIES

FLUORESCENT ADJUSTABLE CLAMP-ON

Adjusts to any desired height - Swings to any angle

Puts real INDOOR DAYLIGHT right where you want it

Insistent demand for Fluorescent Desk Lamps has led many makers to put units on the market as fast as they could rush them out. But we waited until we were right.

Our new **HOLDENLINE** Adjustable Desk Lamp has everything—amazing lighting efficiency (see diagrams showing footcandle readings in various positions)—complete flexibility—beauty—and the latest engineering developments in Fluorescent lighting—for example, a new thermal type auxiliary which gives **instant starting** and **restarting**, which no other manufacturer offers.

No finer piece of lighting equipment has ever been designed for making seeing easy at desk or drafting tables because this lamp puts the light where your eyes work.

The DSK series gives a widespread of real Indoor daylight that makes fine details easy to see—the smallest type of handwriting easy to read—avoids eyestrain and protects the eyesight of those engaged



DSK series showing widespread of light in the area where the eyes work, yet no light in the user's eyes.

in day-long eyework. Makes any kind of desk or office work easier; less fatiguing; gives many times the light (on the desk) of the best overhead lighting.

Adjustability Plus Versatility

THE HOLDENLINE Desk Lamp

REGISTERED U. S. PATENT OFFICE
1 9 3 7

REFLECTOR of genuine Alzak* aluminum specular finish.

SHADE one-piece stamping streamlined to throw the light on the proper working plane.

EXTENSION ARM can be adjusted to suitable heights and has both a universal joint and a swivel joint so that it can be swung to any angle or position to give better light where you want it.

CLAMPS ON THE TABLE saves valuable working space - making possible a smaller shade—no obstructions on desk.

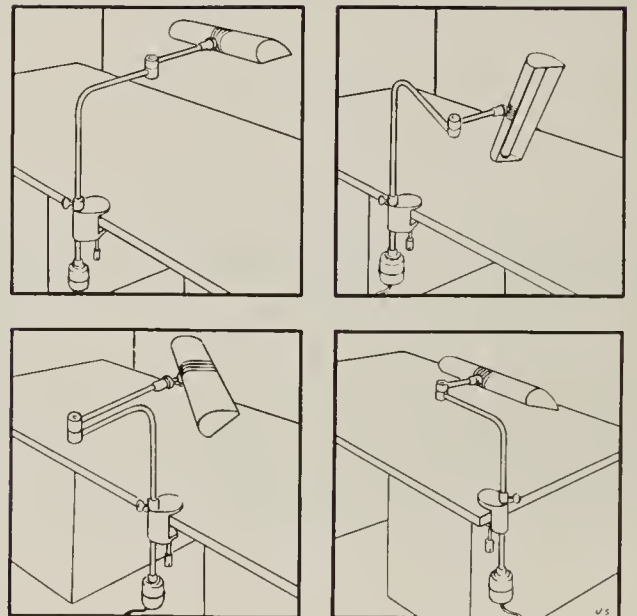
BUILT FOR LASTING SERVICE and highest lighting efficiency.

HORIZONTAL ADJUSTMENT joint is made to a tolerance of 4/10000 of an inch.

UNIVERSAL JOINT can be tightened with fingers and is made oversize to assure long life without slipping.

COMPARE this with any other Fluorescent desk lamp - You will quickly see why it gives you more for the money.

* "Registered Trade-mark Aluminum Company of America"



Maximum horizontal extension 23"
Maximum vertical extension 24"

HOW TO ORDER

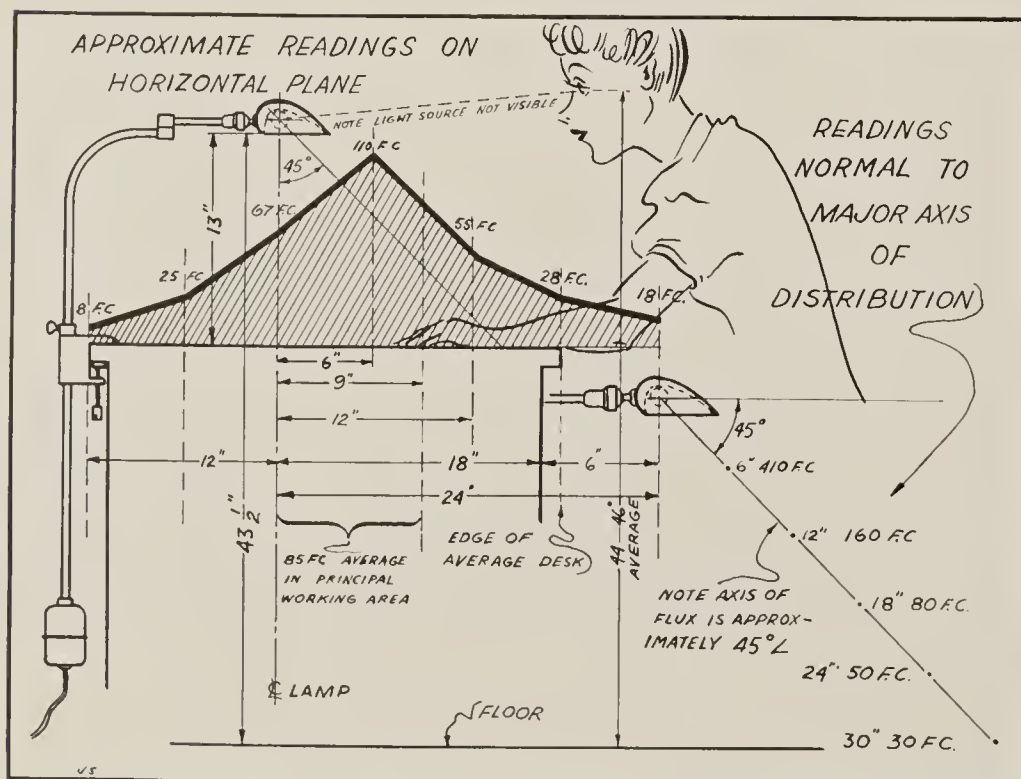
Catalog No. DSK-1 Durable Gray or Brown Wrinkled Finish. Gray will be shipped unless otherwise specified.

Catalog No. DSK-2 Plated Statuary Bronze.

Catalog No. DSK-3 Satin Chrome with Bright Chrome Beading.

All above for 60 cycle 115 volt A.C. operation. Also available for 50 cycle A.C. on special order. Can be furnished for D.C. operation at slight additional cost. When ordered for Direct Current, add DC to the catalog number, as for example, DSK-2DC.

All units furnished complete with switch and 7 foot rubber cord set, lamp not included. Packed one to a case. Shipping weight 14 pounds.



2341 CARNEGIE AVE. DEAN H. HOLDEN CLEVELAND, OHIO

DEAN H. HOLDEN *presents*

FOUR NEW HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Fleur-O-liers

Merchandise Lighting for Sales emphasis at the point of sale



Daylight Fluorescent Lighting puts a new punch in selling. It brings out the good points of good merchandise . . . makes it easy to match or select colors . . . cuts returns . . . and speeds up sales.

After a thorough study of retail stores, we have designed "complete packages" of Fluorescent Lighting for counters and displays.

Compact, inexpensive, and easy to install, they can be plugged in and used wherever the "extra punch" of Fluorescent lighting is wanted, or where color matching is important.

Every store, large or small, can use the new **HOLDENLINE** Fleur-O-liers described on the following pages to increase customer satisfaction and build sales.

The HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

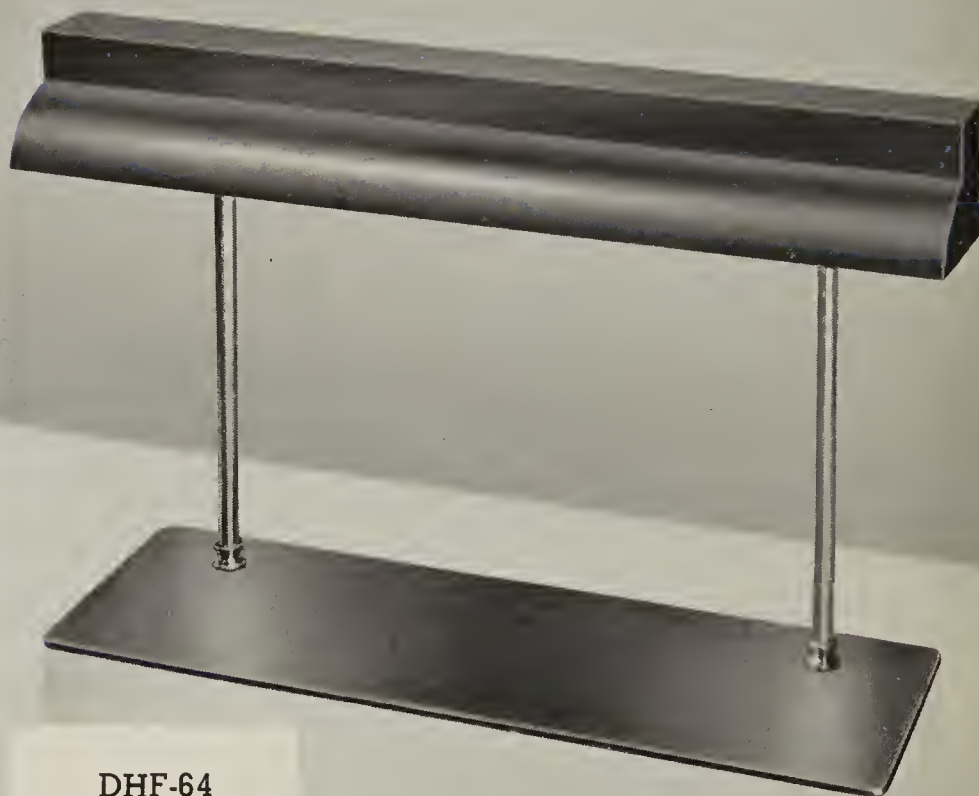
COLOR
MATCHING

Fleur-O-liers

SHOW COLORS AS THEY APPEAR IN REAL DAYLIGHT



DHF-60
for 18", T-8,
15-watt
lamp



DHF-64
for 24"
T-12, 20-watt
lamp

Daylight for color matching has always been the merchant's ideal for "Selling" Lighting. Many times he has seen customers take colored merchandise to the doorway to see how it looked in the daylight. Now that is a thing of the past.

These new units place the closest approach to real daylight ever achieved by artificial lighting on the merchant's counter, or on the top of his showcase . . . at a very reasonable price.

They won't tip, and you can see

through them. The salesman is **compelled** to pass the merchandise through the unit so that the customer can see the merchandise as it appears in outdoor daylight.

The color matching units are companion units for use with our DAYLIGHT DISPLAY Fleur-O-liers. When the Color Matching and Daylight Display units are used in combination, articles taken from the showcase are shown under the same lighting conditions, and so lose none of their appeal.

Description

Made of heavy gauge steel and finished in plated statuary bronze. The carefully designed reflector is of Alzak* Aluminum with a non-tarnishing finish.

DHF-60 for 18" T-8, 15-watt lamps, completely wired with switch and 7' cord set.

DHF-64 for 24" T-12, 20-watt lamps completely wired with switch and 7' cord set.

Both can be furnished for DC operation or 50 cycle AC operation.

* "Registered Trade-mark Aluminum Company of America"

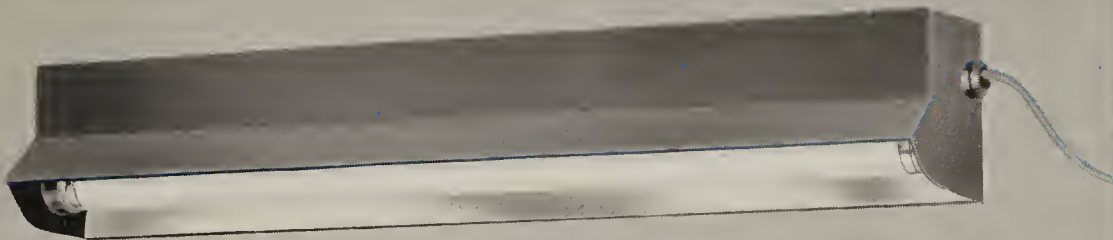
The HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

DAYLIGHT
DISPLAY

Fleur-O-liers

PACKAGE FLUORESCENT FOR MERCHANDISE ILLUMINATION



DHF-18 (left) Daylight Display Unit, for use with T-8, 18" Lamp.
DHF-36 (below) Daylight Display Unit for use with T-8, 36" Lamp.



Description

Sturdily made of heavy gauge steel. Handsomely finished in plated statuary bronze, making a serviceable, good-looking unit for use in any store. The parabolic reflector of Alzak* Aluminum has a non-tarnishing finish, and is carefully designed to throw maximum light down on the merchandise.

DHF-18, for T-8, 18" lamp, wired with 7' cord set and switch.

DHF-36, for T-8, 36" lamp, wired with 7' cord set and switch. Available for 115 and 230 volt operation.

Both can be furnished for DC operation or 50 cycle AC operation.

* "Registered Trade-mark Aluminum Company of America"

These new units are designed primarily for use where expensive custom installations will not fit in, and are far better than anything that the small store has so far been offered. A few dollars, two screws, plug them in and there they are.

As they are portable, they can also be used in large department stores to emphasize "specials" or other merchandise displays where temporary attraction is wanted.

Our Daylight Display Fleur-O-liers are designed for counter or shelf use,

over shoe mirrors and at any other point where strong "down lighting" is needed to boost sales or where the color of merchandise is important. In the fitting room, at the hosiery or necktie counter, and similar spots, these units give sales-making light where it is most needed, as merchandise is shown as it appears in natural daylight. Other uses are given on the following page.

EASILY INSTALLED. Use round head wood or machine screws properly spaced, then place fixture in position by slipping keyhole slots over them.

Other uses

FOR COLOR MATCHING AND DISPLAY UNITS



COUNTER TOP DISPLAY



EXECUTIVE DESK LIGHT



BANK TELLER'S CAGE

COLOR MATCHING UNITS: When silk stockings are shown under DAYLIGHT FLUORESCENT, the result is literally amazing. Beauty of texture is brought out. Sheerness is emphasized. Colors spring to life. A **HOLDENLINE** Color Matching Unit deserves a place on every counter where hosiery is sold — not only to make color selection easy — but to add new sales appeal.

Our DHF-64 FLUORESCENT also makes a splendid desk lamp. Delivering real indoor daylight, it provides the nearest thing to perfect working light thus far achieved for the business man's desk. The high intensity, glareless daylight makes it easy to examine minute detail without eyestrain.

DAYLIGHT DISPLAY UNITS: Can be used for the lighting of tellers' cages in banks, as Fluorescent lighting with the daylight lamp has peculiar advantages for the detecting of counterfeit money, far superior to any other bank light. For overhead lighting our 900 series is recommended.

Jewelers find that the DAYLIGHT DISPLAY units provide excellent light for displaying silverware, glass, gold, but not for cut stones such as diamonds, nor for pearls. Florists use them to bring out the beauty of leaves and flowers. Libraries and museums use them for examining colored prints or for lighting paintings, and they are used for many other specialized local lighting purposes.

MANUFACTURED BY

2341 CARNEGIE AVE. **DEAN H. HOLDEN** CLEVELAND, OHIO

SPECIFICATIONS

HOLDEN_{LINE} FLEUR-O-LIER

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Daylight Display Units

DHF-18 and DHF-36

- . . . Heavy gauge steel with plated Statuary Bronze Finish.
- . . . Alzak* Aluminum reflector - non-tarnishing finish.
- . . . Length: 18½ inches and 36½ inches.
- . . . Width: 2¾ inches.
- . . . Height: 3 inches.
- . . . Two punched keyhole slots in back for mounting.
- . . . Operate on 60 cycle AC current 115 volt.
 Available for 50 cycle operation on special order.
 Operate on Direct Current 115 volt.
 Specify current and frequency on all orders.
- . . . Complete with sockets, thermal auxiliary only, switch and cord set.
- . . . For T-8, 15 and 30-watt lamps only.
- . . . 36" size can be furnished for either 230 volt or 115 volt operation on AC but only 230 volt DC.
- . . . Packed one to a carton.
- . . . Shipping weight, DHF-18 5 lbs. DHF-36 8 lbs. Standard package one unit.
- . . . Furnished wired only with 7' cord set. Switch always supplied on front near one end.
- . . . Cord enters at end of unit.
- . . . These fixtures can be furnished up to 6 feet in length on special order. We are also in a position to furnish the DHF-18 with a rounded lip similar to the shade supplied on the DHF-64 but somewhat smaller. We can also furnish what is in effect the shade portion of the DHF-64 for the 24" T-12 Lamp complete with cord set and switch with keyhole slots in back plate on special order. This is known as DHF-24.

* "Registered Trade-mark Aluminum Company of America"

SEE OTHER SIDE BEFORE ORDERING

2341 Carnegie Ave. Dean H. Holden Cleveland, Ohio

TABULATION OF DHF-18 and DHF-36 SERIES

Catalogue Numbers	Lamp Length	Lamp Watts	Lamp Diameter	Complete With Switch, Cord, Sockets and Thermal Auxiliary	Voltage A. C. ● 60 Cycle	Voltage D. C.	List	Jobber Net
DHF - 18	18"	15	T8 - 1"	✓	115			
DHF - 18 D.C.	18"	15	T8 - 1"	✓		115		
DHF - 36	36"	30	T8 - 1"	✓	230			
DHF - 36 C	36"	30	T8 - 1"	✓	115			
DHF - 36 D.C.	36"	30	T8 - 1"	✓		115		

SEE PRICE LIST

● Available for 50 Cycle operation. Prices on application.

NOTE: ALL UNITS ARE FURNISHED WIRED WITH 7' CORD AND
PLUG AND ALL ARE EQUIPPED WITH SWITCH. UNITS
FURNISHED IN PLATED STATUARY BRONZE ONLY.

CHECK THESE QUESTIONS WHEN WRITING ORDER

1. Have you specified complete catalog number?
2. Have you specified voltage and frequency?
3. Have you specified whether for A. C. or D. C.
operation?

NOTE: Lamps not included.

SPECIFICATIONS

HOLDEN^{LINE} FLEUR-O-LIER

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Daylight Display Units

DHF-60 and DHF-64

- . . . Made of heavy gauge steel.
- . . . Plated Statuary Bronze Finish.
- . . . Alzak* Aluminum Reflector — Non-tarnishing finish.
- . . . Durable toggle switch conveniently located at back of fixture.
- . . . Operate on 60 cycle AC current 115 volt.
 - Available for 50 cycle operation on special order.
 - Operate on Direct Current 115 volt.
 - Specify current and frequency on all orders.**
- . . . Complete with sockets, thermal auxiliary only and 7' cord set. Wired only.
- . . . DHF-60 With Thermal Auxiliary for 115 Volt A. C.
- . . . DHF-60DC With Thermal Auxiliary for 115 Volt Direct Current.
- . . . DHF-64 With Thermal Auxiliary for 115 Volt A. C.
- . . . DHF-64M With Magnetic Auxiliary for 115 Volt A. C.
- . . . DHF-64DC With Thermal Auxiliary for 115 Volt Direct Current.

DHF - 60

For 18", T-8, 15-watt lamps only.
Overall Height: 13".
Base: 18" x 6".
Standard package one unit.
Shipping weight, 13 lbs. per carton.

DHF - 64

For 24", T-12, 20-watt lamps only.
Overall Height: 15".
Base: 22" x 7".
Standard package one unit.
Shipping weight, 18 lbs. per carton.

* "Registered Trade-mark Aluminum Company of America"

SEE OTHER SIDE BEFORE ORDERING

2341 Carnegie Ave. **Dean H. Holden** Cleveland, Ohio

TABULATION OF DHF-60 and DHF-64 SERIES

Catalogue Numbers	Lamp Length	Lamp Watts	Lamp Diameter	Complete With Switch, Cord, Sockets and Thermal Auxiliary	Complete With Switch, Cord, Sockets and Magnetic Auxiliary	Voltage A. C. ● 60 Cycle	Voltage D. C.	List	Jobber Net
DHF - 60	18"	15	T8 - 1"	✓		115			
DHF - 60 D.C.	18"	15	T8 - 1"	✓			115		
DHF - 64	24"	20	T12 - 1½"	✓		115			
DHF - 64 M	24"	20	T12 - 1½"		✓	115			
DHF - 64 D.C.	24"	20	T12 - 1½"	✓			115		

SEE PRICE LIST

● Available for 50 Cycle operation. Prices on application.

NOTE: ALL UNITS ARE FURNISHED WIRED WITH 7' CORD AND PLUG AND ALL ARE EQUIPPED WITH SWITCH. UNITS FURNISHED IN PLATED STATUARY BRONZE ONLY.

CHECK THESE QUESTIONS WHEN WRITING ORDER

1. Have you specified complete catalog number?
2. Have you specified voltage and frequency?
3. Have you specified whether for A. C. or D. C. operation?

Note: Lamps not included.

HOLDENLINE DECORATIVE AND DISPLAY UNIT

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Fluorescent

DHF 700 SERIES

A SMARTLY DESIGNED FLUORESCENT FIXTURE



Slim, tubular, streamlined, the Fluorescent MAZDA lamp sets the newest trend in styling with light . . . and calls for a fixture equally modern. Our new decorative Fleur-O-lier was specially designed for the Fluorescent Lamp, using this lamp as the integral part

of the complete streamline design . . . creating a sleek, smart ensemble for modern interiors. The rounded chassis is more pleasing to the eye than bulky rectangular forms . . . and more efficient as it directs more light from a large source toward the wall.

Display

AND DECORATIVE POSSIBILITIES UNLIMITED



The decorative and display possibilities of this new **HOLDENLINE** Fluorescent are unlimited. It is ideal for restaurants, night clubs, theater lobbies, beauty shops, and other places where smart decorative lighting is required for attraction and decoration. It may be used in stores, fur salons and fitting rooms in general. It serves many purposes in department stores; for auxiliary daylight lighting in windows; as a night light; as a cool and cheerful source of light in elevator cabs, where we suggest the use of a white lamp. Gasoline stations, bars, and practically every business place seeking to attract new customers, may use this new Fluorescent to advantage.

We have given as much thought to the construction of this new fixture as we have to its appearance. The enamel finishes are similar to those used on the



finest refrigerators. The back plate is steel, cadmium plated. The metallic finishes are all electro plated. Where chrome is used, a heavy underfilling of copper is first applied. Well made throughout, quickly and easily installed.

Available in these finishes:

Ivory, black or white enamel, satin or bright chrome finish on steel chassis. Also satin or bright chrome on brass chassis.

This unit takes the T-12 24" Fluorescent Lamp only.

Can be furnished for operation on DC at slight additional cost, also available for operation on 50 cycle AC at additional cost.

2341 CARNEGIE AVE. **DEAN H. HOLDEN** CLEVELAND

SPECIFICATIONS

HOLDEN_{LINE} FLUORESCENT

REGISTERED U. S. PATENT OFFICE
1 9 3 7

Wall Brackets

DHF-700 SERIES

This unit takes the T-12 24" Fluorescent Lamp Only

- . . . Available in the following finishes:
 - High baked enamel, high gloss finish in Ivory, Black or White, on heavy gauge steel.
 - Bright or Satin finished Chrome on either heavy gauge brass or steel.
Be sure to specify Bright or Satin.
 - Brass chassis in Chrome finish only, specify Bright or Satin.
- . . . Metallic finishes on steel chassis are all electro-plated.
- . . . Where chrome is used, a heavy filling of copper is first applied.
- . . . 26 inches long, 3 $\frac{3}{8}$ " wide, 3 $\frac{5}{8}$ " high.
- . . . Steel back plate is punched for mounting on 3" octagonal box, switch box or on 4" box with reducing plaster cover.
- . . . Box may be located in 3 positions . . . high, center or low.
- . . . Operate on 60 cycle AC current 115 volt.
 - Available for 50 cycle operation on special order.
 - Operate on Direct Current 115 volt.
 - Specify current and frequency on all orders.**
- . . . Furnished wired or unwired, with or without high grade toggle switch, with or without convenience outlet in switch end.
- . . . Furnished with thermal auxiliaries only.
- . . . Packed one to a carton. Shipping weight 7 lbs.

SEE OTHER SIDE BEFORE ORDERING

2341 Carnegie Ave. **Dean H. Holden** Cleveland, Ohio

TABULATION OF 700 SERIES

FOR 24" LAMP ONLY

Catalogue Numbers	Steel Chassis	Brass Chassis	Finish	Thermal Aux. & Sockets	115 Volt 60 Cycle A.C. ● †	List	Jobber Net
DHF - 700 A	✓		Ivory	✓	✓		
DHF - 700 B	✓		Black	✓	✓		
DHF - 700 C	✓		White	✓	✓		
DHF - 700 D	✓		Chrome	✓	✓		
DHF - 700 E		✓	Chrome	✓	✓		
DHF - 704 A	✓		Ivory	No Auxiliary or Sockets			
DHF - 704 B	✓		Black	"	"	"	"
DHF - 704 C	✓		White	"	"	"	"
DHF - 704 D	✓		Chrome	"	"	"	"
DHF - 704 E		✓	Chrome	"	"	"	"

SEE PRICE LIST

● Can be furnished for 115 volt, 50 cycle A.C. on special order.

† Can be furnished for 115 volt D.C. on special order.

NOTE: All No. 700 units include sockets and auxiliary but are **not wired**, wiring, switch, convenience outlet **extra**. No. 704 series include no sockets or auxiliary.

CHECK THESE QUESTIONS WHEN WRITING ORDER

1. Have you specified complete catalog number?
2. Have you specified wired or unwired?
3. Have you specified with or without switch?
4. Have you specified with or without convenience outlet?
5. Have you specified A.C. or D.C. and frequency?
6. Have you specified if **Chrome** whether **Satin** or **Bright**?

NOTE: Lamps not included.

Sensational News

HOLDENLINE

REGISTERED U. S. PATENT OFFICE
1 9 3 7

LENS BRACKET

Yes, we made it big! We made it big for the same reason that I. E. S. Better Sight Lamps are big . . . because that's the only way we can get the lighting results we are after.

We wanted a scientific light for use over the bathroom mirror . . . something infinitely better than the old fashioned fixture with its glaring, exposed bulb.

We wanted a bracket that would make reading in bed a comfort.

We wanted a light that could be used for applying make-up, for fitting millinery, for many other purposes where a strong, down beat of concentrated, glareless light is needed . . . plus scientific general illumination.

We got what we were after in our new Lens Bracket. Men say it is a splendid shaving light. Women like it for the boudoir table. Retailers find dozens of uses for it. We believe it is the outstanding sensation in fixtures of its type.



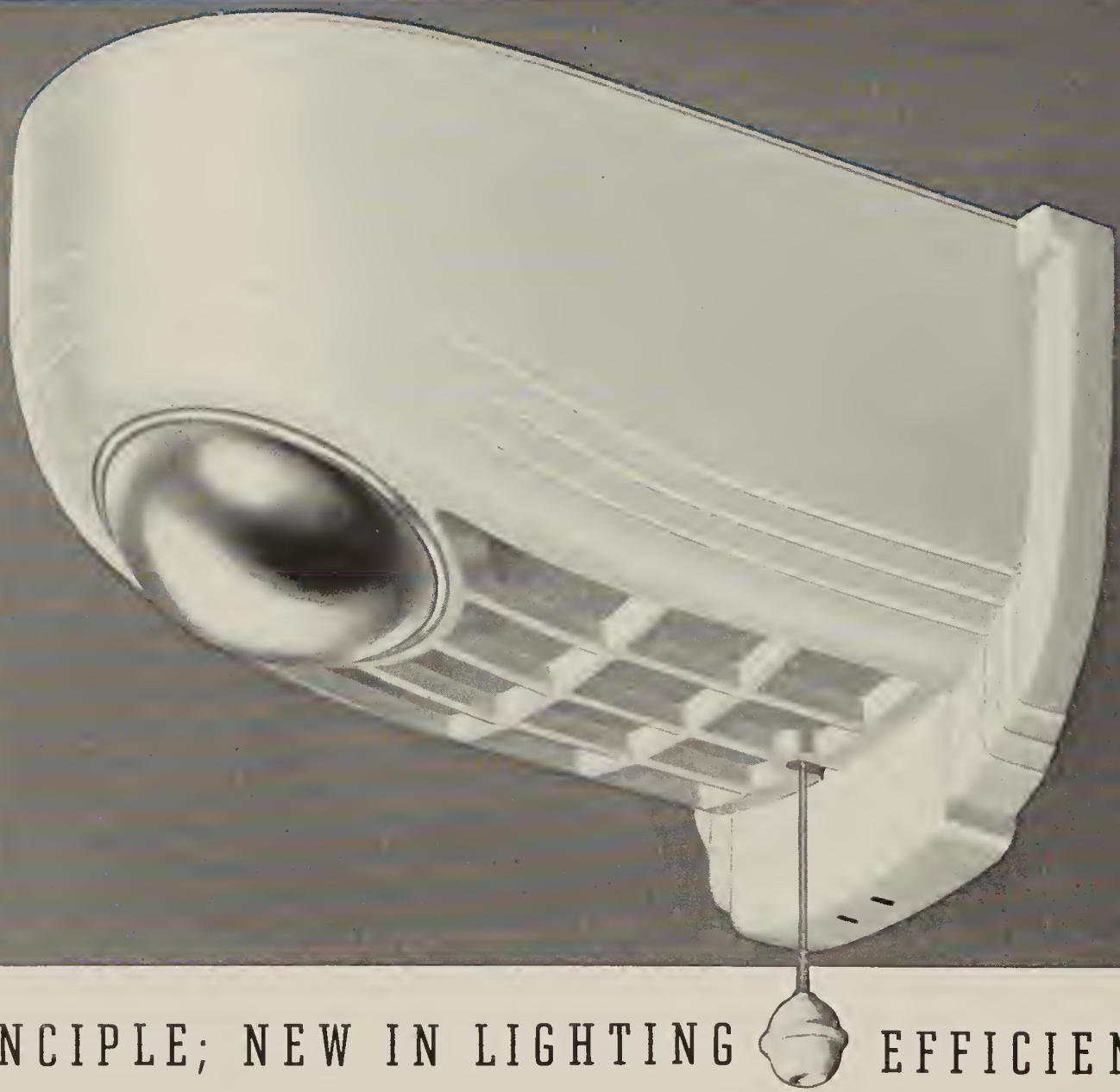
H O L D E N L I N E

R E G I S T E R E D U . S . P A T E N T O F F I C E

PLASTIC Lens Bracket

DHL 800 SERIES

A cleanly designed, creamy white plastic bracket. Sconce plate and shade are designed as one unit. Molded-in, flush convenience outlet for electric razor. Designed for a 75-watt lamp only, which provides adequate light for all conditions. Easily cleaned, shock-proof, and will not discolor from heat. **DHL-800**, keyless. **DHL-801**, with pull switch. Furnished unwired. Also furnished with 7' cord set and hanger for mounting anywhere. **DHL-802** without pull cord. **DHL-803** with pull cord.



NEW IN PRINCIPLE; NEW IN LIGHTING EFFICIENCY

Our new Lens Bracket concentrates 200 footcandles of light . . . 6 or 7 times as much as the average bathroom light . . . on the area where the action takes place. That's why it makes an excellent light for shaving . . . applying make-up and many other purposes.

Due to a new type lens, developed in cooperation with Nela Park, this high intensity lighting is obtained without glare.

Designed on the Study Lamp principle, the Lens Bracket also distributes light through the open top to

provide pleasing general illumination, avoid sharp contrasts, and reduce eyestrain.

This makes the Lens Bracket the ideal bed-lamp, as it not only provides abundant glareless light on the book but a high level of general illumination, which is needed to prevent eyestrain. In this connection, eyesight specialists say, "never recommend a ratio exceeding 10 to 1 between acting area and general level of illumination, because of fatigue to the muscles of accommodation of the eyes."

UNDERWRITERS LABORATORIES APPROVED AND LABELED

LIGHT FOR DECORATION

KEYED TO THE STYLE OF TODAY



The demand for Lumiline Lighting is growing fast. These new linear light sources give smart new lighting effects that harmonize with modern decoration.

Some of the places our Lumiline Brackets can be used - smart night club, bar, restaurant, are illustrated. There are dozens of other spots where they will add an attractive touch to win trade.

They can be used in quarters where space is at a premium.

Compact, space saving, with little projection from the wall, they make excellent lighting units for closets or the ice-box alcove.

Yachting enthusiasts like them because they don't waste space, can't peel or tarnish and can be plugged into a 115-volt power line when tied up to the dock.

Easy to install as fixture strap and screws are furnished for quick mounting in any position. Use them wherever light for decoration is wanted.

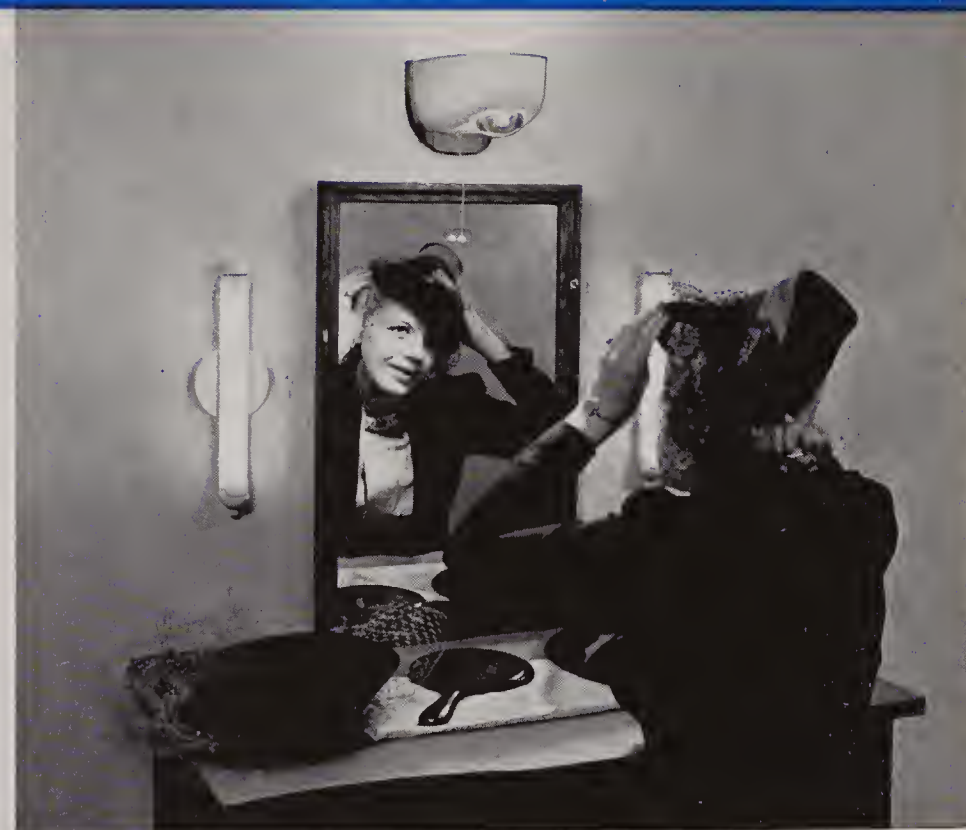


A NEW COMBINATION OF
BETTER LIGHT AND DECORATIVE BEAUTY

H O L D E N L I N E
R E G I S T E R E D U . S . P A T E N T O F F I C E

LENS AND LUMILINE BRACKETS Used in Combination

PLASTIC Lumiline Brackets DHP-200 and 400 Series



While our new Lens Bracket alone makes a splendid "over-the-mirror fixture," when it is used with our Plastic Lumiline Brackets, a perfect combination is achieved for mirror lighting.

Retailers have been quick to see the advantage of this combination for lighting mirrors in fitting rooms and at millinery tables. The concentrated glareless down lighting, plus the side lighting from the

Lumiline Brackets, makes it easier for the customer to make quick and satisfactory selection.

Originally designed for use over the bathroom mirror, as a shaving light, the Lens Bracket is also excellent at the boudoir table for hair dressing and make-up. Jewelers use it for "point" lighting as it adds new brilliance to cut stones and new lustre to pearls. Other applications range from the kitchen stove to the manicurist's table in a beauty shop.

A UNIT DESIGN OF LAMP AND FIXTURE

Our Lumiline Brackets are essentially decorative. In rich ivory, white or lustrous black, they present a new conception of modern, clean design. That they meet the new trends in architecture and decoration is shown by their wide sale from coast to coast.

They have many applications for decorative and attention-attracting effects in theater lobbies, night clubs, bars, entrance-ways, barber shops, exposition displays, and roadside stands.

In homes, when used beside the bathroom mirror, in conjunction with our Plastic Lens Bracket, they provide the ideal light for applying make-up or for shaving. Other uses are shown on the following page.



Rich Ivory, White or Lustrous Black for 12 and 18 inch Lumiline Lamps. A new conception of modern clean design. Socket assembly molded as integral part, concealing screws. Attractive Sconce Plate.

Designed to modify and decorate the cap and base assembly, making this bracket a UNIT DESIGN OF LAMP AND FIXTURE.

Underwriters Laboratories Approved & Labeled

SPECIFICATIONS

13½ inch long for 12" Lamp with 4½" Sconce Plate. Body of Fixture 1½" wide, 2" Overall Height. 19½ inch long for 18" Lamp with 4½" Sconce Plate. Body of Fixture 1½" wide, 2" Overall Height. Furnished with plated

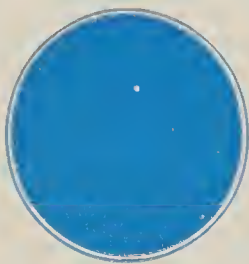
brass screw and 4" adapter strap. Wired with switch and pig tails. Packed individually twelve to a case. Shipping weight on 12" size, ten pounds per carton. 18" size, 13 pounds per carton.

H O L D E N L I N E

R E G I S T E R E D U . S . P A T E N T O F F I C E
1 9 3 7

Molded Plastics

Molded Plastics are a synthetic product, fabricated under enormous pressure in the presence of heat. They have a high ratio of strength to weight, uniformity of structure and color, resistance to weather, water, oils, solvents, salt air and most acids. There can be no rust, tarnish, or peeling of surface. Our plastics have excellent electrical characteristics and resilience to absorb mechanical shocks, together with a permanent high gloss. Our fixtures offer complete safety from shock.



FOR THE TECHNICALLY MINDED . . .

Fluorescent Lamps

by DEAN H. HOLDEN

FLUORESCENT Mazda Lamps were developed to provide new efficient and economical sources of artificial daylight and colored light. It has always been the dream and hope of the lighting industry to produce light of the spectral quality of daylight.

This goal has been achieved in the Daylight Fluorescent Mazda lamp. It provides artificial daylight at high efficiency, is of low brightness comparable to hazy sunlight, and the "footcandles" obtained with this new light source are comparable in "coolness" with those provided by natural skylight through an open window.

Fluorescent Mazda Lamps produce light in these attractive colors: Blue, green, pink, gold, red, white and daylight.

These new light sources are receiving widespread attention and offer almost unlimited possibilities for lighting, for decoration, for use with air-conditioning, and as a duplication of daylight. They are apparently destined to play an important part in the scheme of illumination and decoration in many industries as well as in homes, shops, hotels, night clubs, offices and so on. The attraction which they have comes somewhat from their newness of course, but is chiefly the result of their high efficiencies, their relatively low brightness, their many attractive colors, their shape which is so suitable from an architectural standpoint, and their ability to produce light of daylight quality.

HOW THEY WORK

In the ordinary filament lamp, it is well known that the source of light is a filament of tungsten wire,

either coiled or straight, which is mounted on a stem in a bulb, either in vacuum or in an inert gas at nearly atmospheric pressure.

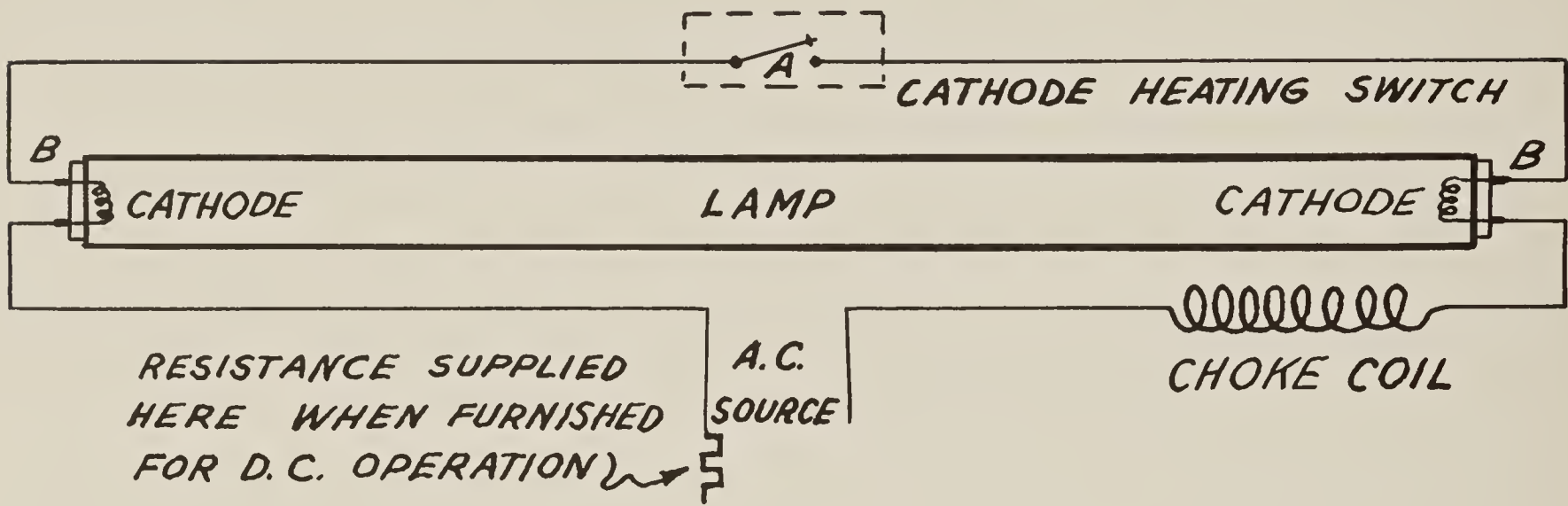
The source of light in a fluorescent lamp is a specially and carefully controlled synthetic powder which adheres to the inner surface of the bulb. Five different powders or **phosphors** are in general use which, when used alone give the following colors: calcium tungstate — blue, magnesium tungstate — blue white, zinc silicate — green, zinc beryllium silicate — yellow white, cadmium borate, pink.

The fluorescent Mazda lamp uses electrical energy to generate by means of a low pressure mercury arc, a large amount of ultra-violet radiation at a particular wave length, which is measured in Angstrom Units. The Angstrom unit is a minute unit of length equal to one-hundred millionth of an inch, and is used to express the length of light waves. These waves are similar to long and short radio waves and range in length from the short, invisible ultra-violet rays to the long infra-red waves.

Phosphors are tuned into the invisible ultra-violet radiations from the mercury arc, and as these phosphors oscillate at a frequency in the visible spectral range, they serve as transformers of energy and convert the invisible ultra-violet waves into visible light. Each phosphor produces light of a different color or tint, and since practically all of the spectral colors can be made available, it is obvious that by proper mixing and blending, light of daylight quality can be produced.

We get more technical . .

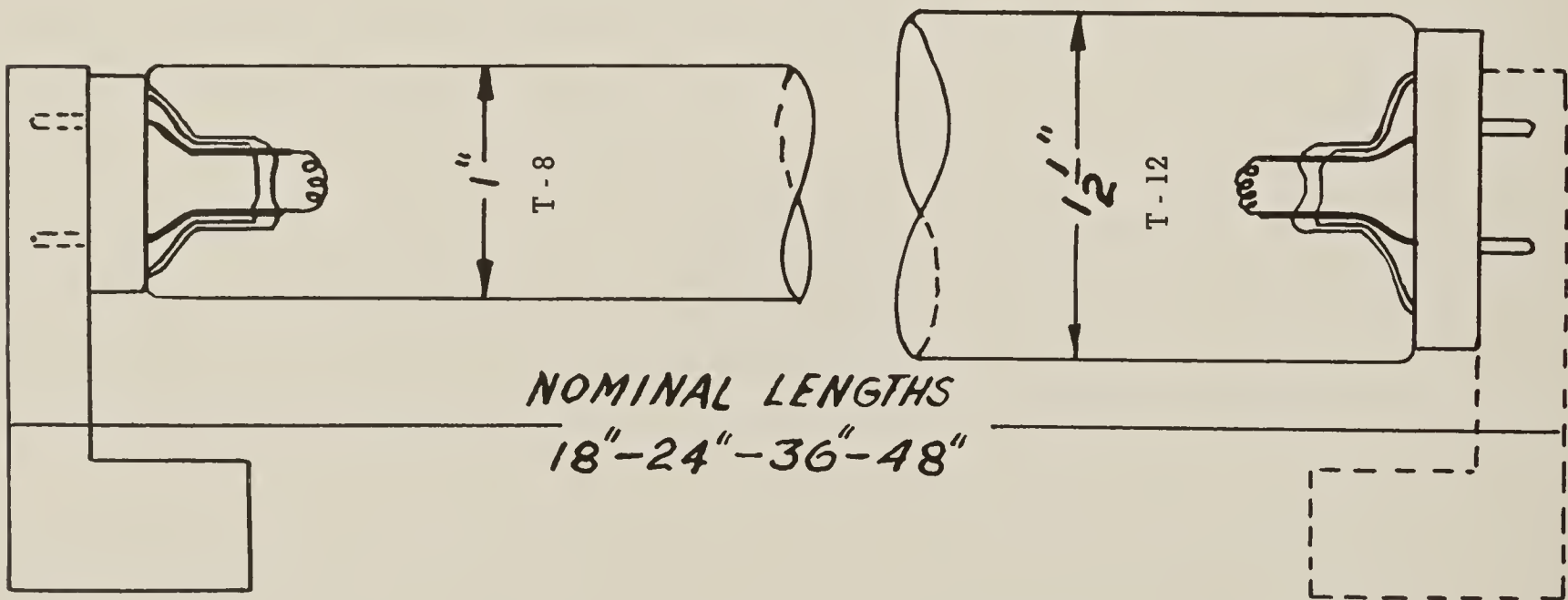
Elements of Typical Lamps and Auxiliary Circuit



In order to start the fluorescent lamp with pre-heated cathodes, it is necessary to connect together by some manual or automatic device "A" those ends of the two cathodes "B" which are not connected to the current source. While this contact is made, the starting current, limited by the choke coil, flows through the cathodes "B" bringing them up to the proper temperature. The

circuit through the device "A" is then interrupted by suitable means, producing an inductive "kick" between the electrodes, which strikes the arc. The arc current is limited by the choke coil, and an additional resistor in the case of D. C. Various electrical and electro-mechanical principles are possible for the starting device. Resonant circuits may also be used.

Construction Details of Fluorescent Lamps



	15-watt 18-inch T-8	15-watt 18-inch T-12	20-watt 24-inch T-12	30-watt 36-inch T-8	40-watt 48-inch T-12
Nominal Lamp Watts	15	15	20	30	40
Nominal Lamp Amperes	0.30	0.33	0.35	0.33	0.42
Nominal Lamp Volts	56	48	62	103	108
Nominal Line Volts	110-120	110-120	110-120	220-240 110-120	220-240
Lumens - Daylight Lamp	450	450	640	1050	1400
Overall Length	17-25/32"	17-25/32"	23-25/32"	35-25/32"	47-25/32"
Diameter	1"	1 1/2"	1 1/2"	1"	1 1/2"
Life, Hours	2000	2000	2000	2000	2000

lighting about 40% of the current performs no useful work. Hence this entire system has a 60% power factor because it can use only 60% of its designed capacity. This does not cost the consumer more at the meter, but it does cost the power company more to produce this unmeasurable current, and the consumer must provide heavier wiring. By power factor correction, it is possible to get more light from existing wiring through the use of Fluorescent lamps.

What can we do to improve power factor? We can put in what is called a capacitor in the circuit, and, if this is of the right size, it will satisfactorily neutralize the effect of the fluorescent lamps and auxiliaries just as if we could somehow reduce the weight of the dumb-waiter in the above analogy to about 6 or 7 pound, i. e., about 10% of the total. In this case the total pull on the rope would be 67 pounds with a so-called power factor of about 90% which would represent an electric circuit with a good power factor correction. Expert engineering is required to choose the proper capacitor. The better fixture manufacturers are in a position to furnish this data for the particular problem.

D. C. Operation of Fluorescent Lamps

Fluorescent Lamps can be operated very satisfactorily on direct current. They require a ballast or current limiting device of course, just as they do for A. C. operation. We have learned that a reactor is generally used as a current limiting device and in order to accomplish the same result on direct current, it is necessary that D. C. resistance of the current limiting device be the equivalent of or equal to the impedance of the reactor when used on alternating current. Inasmuch as the D. C. resistance of the reactor by itself is not the equivalent of its A. C. impedance, it is necessary to add resistance in series with the reactor to bring about this condition. It is necessary, of course, that the proper auxiliary and proper resistance values be used with specific lamps.

It is interesting to note that the D. C. current is lower than the A. C. current at rated voltage.

It must be remembered that there are certain types of auxiliaries available for special applications which do not lend themselves to D. C. operation. For instance, there are auxiliaries available which permit the use of 30 watt lamps on 115 volt A. C. service. Because these are either resonant auxiliaries or auxiliaries having step-up transformers, they cannot be used on D. C. circuits. Likewise, the auxiliaries for operating dual lamps cannot be used on D. C.

36" and 48" lamps can only be operated on 230 volts D. C. they are not available for 115 volt D. C. operation under any condition.

The resistor must be connected in one side of the line so that it will be in series with the lamp and standard auxiliary during normal operation.

Inasmuch as resistors are available in a number of mechanical forms, it is necessary that great care be used in the choosing of the proper type of resistance unit so as not to impair surrounding auxiliary equipment because of excessive heat and so that the temperature resistance coefficient will not

change the resistance value outside of generally accepted resistance tolerances. It has been pretty generally agreed that the resistance values are critical and that these values shall remain under all conditions within plus or minus 5% of the correct values.

It must be remembered that some types of resistance units are rated in terms of 250°C. rise and some units rated in terms of 100°C. rise. Because of the types of insulation used, 75°C. maximum temperature has been established as a maximum not to be exceeded under any conditions. Since ambient is generally 24°C., a maximum rise of 51°C. is indicated. It must be remembered therefore, in choosing resistors, that all these factors must be taken into account.

Under certain conditions, particularly for desk lights, it is practical to use a resistance cord such as has long been supplied for operation of small portable radios. The wire in this cord must however be of a special type, whose resistance is virtually independent of the ambient temperature. Certain manufacturers have supplied desk lights with cords not meeting this mandatory standard.

Underwriters' Laboratories have indicated that good electrical practice as far as insulation is concerned, must be followed and proper care taken that the heat dissipated by the resistor do no damage to surrounding auxiliary equipment or to the insulation of the wire in the circuit.

It has been suggested that resistance only be used, without a reactor, for current control on D. C., but it has been found essential that a reactor be used in order to get sufficient induced voltage to start the lamps.

WARNING!

Important points you ought to know before you plug in Fluorescent units.

Warn your customers and save trouble and expense.

A. C. Units

Do not plug A. C. Units into D. C. current. If you or your customers make this mistake, you face expensive repairs, since this not only burns out, but injures the wiring and reactor, necessitating its return to the factory. No replacements will be made for this cause; time, material and transportation will be charged.

D. C. Units

Once the unit has been plugged into a D. C. circuit, and been in operation, we recommend that you do not remove the plug during the life of the fluorescent tube, for in returning the plug, you may reverse it and thus reverse the polarity of the circuit. This often results in unsatisfactory operation of the tube; it may be slow to start or fail to start at all.

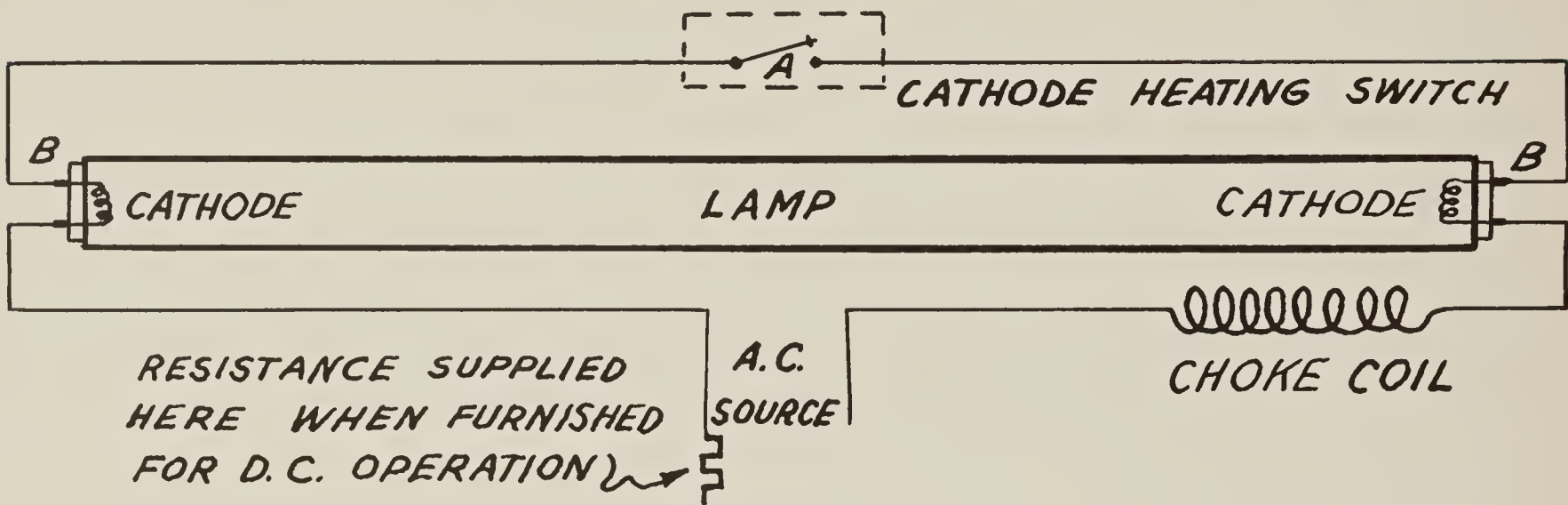
Voltage Limits

Uncertain starting and operation may result below 112 volts with some types of auxiliaries although most of them work as low as 105 volts or 210 volts on nominal 115 or 230 volt currents.

Decreased life and danger of overheating auxiliaries may occur at excessive overvoltages.

We get more technical . .

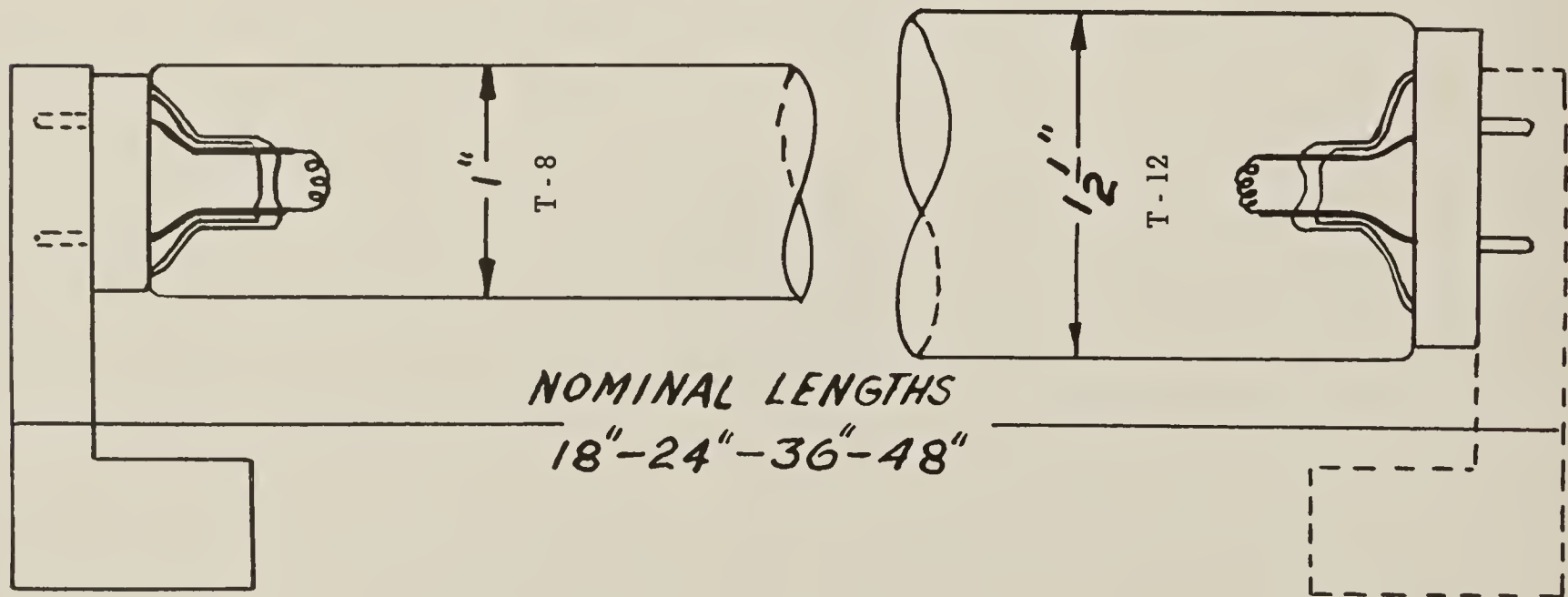
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Life, Hours	2000	2000	2000	2000	2000

Varying Efficiencies of Lamps

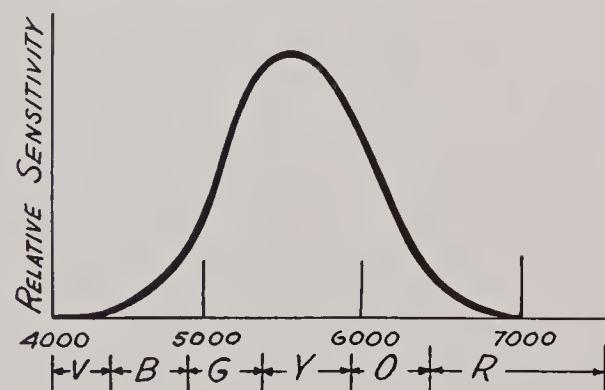
Fluorescent Mazda Lamps yield luminous efficiencies from three to two-hundred times as great as those of incandescent lamps of corresponding colors and wattages, depending on color of light produced. Current rated efficiencies in lumens per watt for the various sizes are given in the table below. These however are being constantly increased. Figures given are extremely conservative:

	18"	24"	36"	48"
Daylight	30	32	35	38
White	30	32	35	38
Blue	18	19	21	
Green	60	65	70	
Pink	20	22	24	
Gold	18	19	21	
Red	3	3	3	

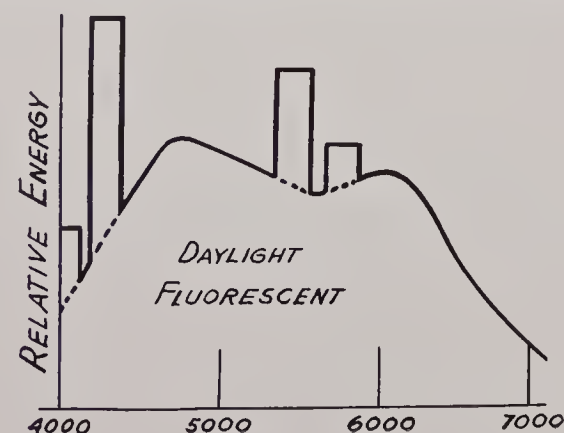
These varying efficiencies are partly due to the effect of the different wavelengths on the eye.

Energy of different wavelengths affects the eye differently in two ways: First as to color. Short wavelengths produce the sensation of violet, somewhat longer waves are recognized by the eye as blue, and so on through the spectrum to the longest visible waves — the red ones. From a seeing standpoint a varying quantitative effect is also produced by energy of different wavelengths. Thus a certain amount of blue radiation coming from a surface will cause it to appear much less bright to the eye than would the same amount of yellow radiation because the eye is much more sensitive to the yellow. The sensitivity curve of the eye shows the varying response of the eye to energy of different wavelengths.

THE EYE LUMINOSITY CURVE shows the varying quantitative effect of different wavelengths on the eye. The approximate limits of the main spectral colors are also shown.



SPECTRAL ENERGY CURVE of Daylight Fluorescent shows how energy is distributed throughout the spectrum. (The wavelength scale below the curve is in angstrom units, 1 cm.=108A.)



Approaching Daylight Coolness

Daylight Fluorescent Mazda lamps being two to three times as efficient as the common Mazda filament lamp of equal wattage, naturally, there is less radiant energy, and therefore less heat effect associated with each lumen or footcandle. However, for certain reasons the footcandles obtained with this new light source are much cooler than is indicated by the luminous efficiency or lumens per watt. Actual measurements of radiant energy (or heating effect) made with a thermopile placed where the footcandles were also measured, yielded the relative values approximately as presented in the accompanying table.

Approximate Relative Radiant Energy (or Heating Effect) per Footcandle

15-watt Daylight Fluorescent MAZDA lamp	1.0
30-watt MAZDA Lumiline lamp	10.3
40-watt MAZDA (tungsten-filament) lamp	5.2
100-watt MAZDA (tungsten-filament) lamp	4.5
200-watt MAZDA (tungsten-filament) lamp	4.0
500-watt MAZDA (tungsten-filament) lamp	3.5
Natural skylight through glass window	0.35
Natural skylight through open window	0.45
15-watt Daylight Fluorescent MAZDA lamp with 1/8 inch of ordinary glass interposed	0.33

A study of the table reveals rather surprising results. It is seen that the radiant heating effect per footcandle from the Daylight Fluorescent Mazda lamp is only about one-quarter that from large Mazda tungsten-filament lamps. It is only one-fifth to one-tenth that from the smaller Mazda filament lamps. It is only about three times that of the "coolest" daylight which is skylight through a window. When a thin piece of ordinary glass is interposed between the Daylight Fluorescent Mazda lamp and the place where the footcandles are measured, the heating effect per footcandle is about the same as that of the "coolest" daylight. The footcandles from this new illuminant are cool beyond the hopes of the engineers even a short time ago. This is a very important aspect in this new era of more light and better lighting when levels of illumination have already increased in many cases to the point of noticeable heating effect and even of annoyance or discomfort to the user of light.

Fluorescent Lamps and Air Conditioning

The high efficiencies and cooler footcandles of the new Fluorescent Mazda lamps make them ideal for use (1) in both old and new interiors where air conditioning is being considered, and (2) for providing a means of improving the illumination in air conditioned rooms which are inadequately lighted.

In the first case the fluorescent lamp becomes the ally of the air conditioning engineer and in the second case it is a god-send to the lighting engineer, who has the job of providing better lighting for a building in which an air cooling system is already operating at full capacity. In either case the daylight fluorescent lamp provides white light which blends with natural light and in this respect it is very pleasing and psychologically cool.

But even more important than their pleasing cool appearance is the fact that fluorescent lamps provide higher levels of illumination per watt than standard Mazda lamps. See table page 3.

Today, lighting engineers specify lighting on the basis of the requirements of the **seeing task** which means that they appraise the job to be done from a seeing standpoint, and translate it into terms of needed footcandles. The minimum number of footcandles required determines the watts per square foot. When a predetermined level of illumination is provided by Fluorescent lamps, the heat from the lighting, which is always a considerable factor in the refrigeration load is considerably reduced. In general, each watt of lighting means a watt of power for air conditioning. Certain installations already made indicate that lighting levels may be maintained with a reduction of as much as one-third in the cooling power. Remember, however, that total watts include those dissipated by the lamp, plus the necessary auxiliary, determine the total heat factor of the lighting system.

From the standpoint of the user, Fluorescent lighting is cooler because only one-fourth as much heat is **radiated** per watt and thus directly strikes the user.

Stroboscopic Effect and Possible Methods of Control

Every lamp, no matter what kind, when burned in the usual manner on alternating current, has a non-uniform light output due to the cyclic variations in current, which is increased at lower frequencies. Whether or not this non-uniformity results in an objectionable flicker depends upon other things as well as upon the frequency. In filament lamps a small wire size is conducive to variations because of its more rapid cooling between half cycles. In electric discharge lamps where practically no energy is stored up in the light giving medium, the light drops almost to zero along with the current between each half cycle. Fluorescent powder, however, except for the blue-fluorescing variety has a persistence of glow or phosphorescence which helps to reduce cyclic light fluctuation and this characteristic is affected by the kind of phosphor being used. Ordinarily the slight fluctuations from fluorescent lamps are not noticed on 60-cycle current and with lamps burned on two or more phases or with the use of the new two-lamp, power factor corrected auxiliaries, the fluctuation in light output is further reduced and is brought to a level comparable with that from the ordinary low wattage filament lamp.

By use of leading and lagging auxiliaries in pairs, stroboscopic effect can be considerably reduced. Such units are in process of development.

It should be noted that Fluorescent lamps are not satisfactory or available for operation on 40 or 25 cycle current. Fifty cycle is the lowest practical frequency.

Color Matching

One important use of the Daylight Fluorescent lamp is in commercial color matching. This is the first artificial light source which produces directly a close approximation to natural daylight at high effi-

ency. Although the spectral distribution of the light is not an exact match of average daylight, due to the presence of the characteristic mercury arc lines and a slight deficiency in the deep red end of the spectrum, it is satisfactory for the great majority of commercial color work. Fortunately, the eye is not sensitive in the deep red so this defect is scarcely noticeable. Already in the textile field, it is being used very successfully for the inspection of silk hose as well as for the inspection of dyed wool fabrics of various colors. It is excellent for the comparison of white porcelain enamels and it is now being used for the inspection of white enameled electric ranges, refrigerators and kitchen cabinets. An important field for this light source is color printing. A very satisfactory installation is now in use at one of the large magazine publishing houses for the comparison of their color pages with the original paintings.

It should not be construed from the foregoing example that the Daylight Fluorescent lamp is a panacea for all work involving color. For example, in one case, the careful selection of standard samples to be used in the grading of raw cotton, it was found that some types of cotton appeared slightly different than when illuminated by north sky light. With the fluorescent lamp, although the majority of samples would fall into their proper classification, in borderline cases the decision could possibly be in error.

It is interesting to note that the green fluorescent lamp is desirable over coal picking tables as it differentiates between coal and slate to a striking degree.

Power Factor and Power Factor Correction

A fluorescent lamp with its auxiliary as used on an AC circuit has a power factor from 50% to 60%; that is, only about 60/100 of the current going through the wiring system does useful work. In other words, there is something about a fluorescent lamp with its auxiliary that requires more current in the circuit than it actually consumes, and fully 40/100 of the wiring capacity is needed for this extra current.

Ward Harrison, Director, Nela Park engineering department, explains power factor by comparing it to a dumb-waiter counterweight with a 40 pound weight, so it can be moved up and down practically without effort. The strain on the rope is 40 lbs.

If 60 lbs. of potatoes were placed in the waiter, it would take a 60 lb. pull on the rope to send it to an upper floor.

The total strain on the rope is not 60 lbs. but 100 pounds because your pull was added to the counterweight which was pulling down 40 pounds.

The rope had to be larger and stronger than would have been necessary if the 60 lbs. of potatoes had been pulled up with a rope run over a pulley. The factor 60/100 gives you the comparison between the useful pull on the rope and the strain on it. That 60/100 or 60% might be called the power factor of the dumb-waiter installation.

Likewise in a wiring system for fluorescent

Where is Fluorescent Going?

What is the magnitude of the fluorescent lamp business? Well, consumer acceptance has been very gratifying; in fact the use of the lamps has grown much more rapidly than might have been expected, and during the month of January, 1939, a manufacturing rate of 1,000,000 lamps per annum was reached. It is not too optimistic to estimate that by 1943 the rate may be as high as 10,000,000 per year.

Looking at the future of the fluorescent lamp from a broad viewpoint, it appears that it supplements rather than supplants the filament lamp. It produces colored light and daylight economically, which the tungsten filament lamp cannot do; it produces cool light and is a light source of extended area and low brightness. Its immediate application will be in cases where these qualities and its novelty are particularly sought. Today the higher efficiency of the lamps is just about offset by the greater investment required per watt for installation and the increased renewal cost of the lamps. At low energy rates, the cost per footcandle may be higher than with filament lamps. However, as the result of further improvements in efficiency and progressive reductions in lamp cost, it will no doubt in the course of years, become a more economical source of light than the familiar filament lamps.

H O L D E N L I N E

R E G I S T E R E D U . S . P A T E N T O F F I C E
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Price List

EFFECTIVE MAY 1, 1939

JUN - 6 1939

THIS PRICE LIST CANCELS ALL PREVIOUS PRICE LISTS

TABULATION OF 900 SERIES UNITS

EACH UNIT DESIGNED FOR ONE LAMP ONLY

Catalogue Numbers	Length	Width	Depth	Watts	Chassis Only	Chassis Thermal Aux. Sockets	Chassis Magnetic Aux. Sockets	Voltage A. C. ● 60 Cycle	Voltage D. C.	Power Factor	List	Jobber Net
DHF - 900 A	18¼"	6⅞"	5½"		✓						\$ 7.00	\$3.50
DHF - 900 B	18¼"	6⅞"	5½"	15		✓		115		50	11.50	5.75
DHF - 900 BM	18¼"	6⅞"	5½"	15			✓	115		50	15.00	7.50
DHF - 900 DC	18¼"	6⅞"	5½"	15		✓			115		14.50	7.25
DHF - 901 A	24¼"	6⅞"	5½"		✓						8.00	4.00
DHF - 901 B	24¼"	6⅞"	5½"	20		✓		115		50	12.00	6.00
DHF - 901 BM	24¼"	6⅞"	5½"	20			✓	115		50	15.50	7.75
DHF - 901 DC	24¼"	6⅞"	5½"	20		✓			115		15.00	7.50
DHF - 902 A	36¼"	6⅞"	5½"		✓						10.00	5.00
DHF - 902 B	36¼"	6⅞"	5½"	30		✓		230		50	16.50	8.25
DHF - 902 C	36¼"	6⅞"	5½"	30		✓		115		50	19.50	9.75
DHF - 902 BM	36¼"	6⅞"	5½"	30			✓	230		50	19.00	9.50
DHF - 902 BL	36¼"	6⅞"	5½"	30		✓		115	80% Leading		21.50	10.75
DHF - 902 DC	36¼"	6⅞"	5½"	30		✓			230		22.50	11.25
DHF - 903 A	48¼"	6⅞"	5½"		✓						12.50	6.25
DHF - 903 B †	48¼"	6⅞"	5½"	40		✓		230		50	20.00	10.00
DHF - 903 BM †	48¼"	6⅞"	5½"	40			✓	230		50	24.00	12.00
DHF - 903 DC	48¼"	6⅞"	5½"	40		✓			230		30.00	15.00

● Available for 50 Cycle operation. Prices on application.

	LIST	NET
For switch on all units add:	\$.50	\$.25
For wiring with pig tails add:	.30	.15
For wiring with SV two-conductor 7' long rubber cord and plug add:	.80	.40
For wiring with SJ three-conductor rubber cord 7' long and three-prong plug add:	1.00	.50
† Step-up transformer for external mounting can be supplied for 115 volt operation.	8.00	4.00

NOTE: Lamps not included.

Desk Lamp

	List	Net
DSK 1	\$15.50	\$7.75
DSK 2	18.00	9.00
DSK 3	19.50	9.75
DC on all above add50	.25

For DC operation add DC to catalog Number as for instance DSK-2DC.

Lamps not included.

Lumiline

	List	Net
Cat. DHP 200 Ivory for 12" Lamp	\$3.45	\$1.15
Cat. DHP 201 Black for 12" Lamp	3.45	1.15
Cat. DHP 202 White for 12" Lamp	3.45	1.15
Cat. DHP 400 Ivory for 18" Lamp	4.35	1.45
Cat. DHP 400 Black for 18" Lamp	4.35	1.45
Cat. DHP 400 White for 18" Lamp	4.35	1.45

Packed individually twelve to a case.

Shipping weight on 12" size 10 lbs. per carton.

Shipping weight on 18" size 13 lbs. per carton.

Lamps not included.

Lens Bracket

	List	Net
DHL 800	\$5.70	\$1.90
DHL 801	6.00	2.00
DHL 802	5.70	1.90
DHL 803	6.00	2.00

Packed individually six to a case.

Shipping weight 18 lbs. per standard carton.

Lamps not included.

Mounting Arms

	List	Net
Cat. No. A-74-122	\$ 7.00	\$3.50
Cat. No. A-74-128	15.00	7.50
Cat. No. 138	2.00	1.00

An additional discount of 10% from jobbers net is allowed on orders for 25 or more Fluorescent Fixtures (which may be assorted for single shipment) at one time.

Terms: 2% - 10 days, 30 days net.

F. O. B. Cleveland, Ohio.

Full freight allowed on shipments of 100 lbs. or more.

NO MERCHANDISE MAY BE RETURNED WITHOUT WRITTEN PERMISSION

MANUFACTURED BY

2341 Carnegie Ave. **Dean H. Holden** Cleveland, Ohio

